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The structural component of linguistic meaning and the reading of normally hearing and deaf children

Helen Mary Eugenie Woodward

WASHINGTON UNIVERSITY

Department of Psychology

THE STRUCTURAL COMPONENT OF LINGUISTIC MEANING AND THE READING OF NORMALLY HEARING AND DEAF CHILDREN

by

Helen Mary Eugenie Woodward

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Introduction

A great many people in a number of fields, including psychology, are concerned with measuring, analyzing, and promoting language comprehension; but very few of them, including the psychologists, bring to these problems any knowledge of linguistic science. No doubt one reason is that linguists have failed to present their subject in such a way as to make its relevance to other fields of study apparent. Recently, however, linguists have appeared who are speaking to linguistic laymen, and psychologists, among others, are listening. The specialty of psycholinguistics has developed. Although its methods are still in their infancy, and its usefulness to the applied fields has yet to be explored, it promises to supply both theory and method for more systematic and strategic forays into the jungles of language development than have so far been attempted. This research is presented as an experiment in psycholinguistic method and its application to the field of education.

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CHAPTER I

THEORETICAL BACKGROUND IN DESCRIPTIVE LINGUISTICS

> Twas brillig, and the slithy toves
> Did gyre and gimble in the wabe;
> All mimsy were the borogoves,
> And the mome raths outgabe....
>
> Somehow (said Alice), it seems to fill my head with ideas--only I don't know exactly what they are.
>
> Lewis Carroll in Through the Looking Glass

In his book, The Structure of English, published in 1951, Professor Charles C. Fries, a linguist then at the University of Michigan, undertakes to explain exactly what eluded Alice in her encounter with the Jabberwocky. He points out that the total linguistic meaning of an utterance is made up of two elements--lexical meanings (the dictionary meanings of the various words used) and structural meanings (meanings conveyed by items of word form and arrangement operating in a system, that are not inherent in the words of the utterance standing alone). The "ideas" which the Jabberwocky poem stimulates are, in Friesian terms, the structural meanings for which the following framework contains the signals:

Twas _____, and the _____y _____s

Did _____ and _____ in the _____;

All _____y were the _____s,

And the _____ _____s _____.

Lexical meanings are absent, but structural meanings are carried by the framework through

a. word arrangement,

b. word form,

c. words that signal information about missing words and their relations.

Word arrangement, for example, tells us that things called toves performed two actions in a place called a wabe. Items of form, such as the "y" ending of slithy and the "s" of toves, tell us that there were more than one of the things called toves and that they were of a slithy nature. The words the and and tell us respectively that toves are things, and that they performed more than one action.

Fries goes on to show that even in an utterance containing only nonsense words, structural meanings are present. For example, in the following:

Woggles ugged diggles

we know that Woggles is someone's name or stands for things of some sort; that, in the latter case, there are more than one of them; and that at some time in the past they performed an action directed towards other things called diggles. Lexical meanings are entirely absent in this utterance, but if we assume that the structural signals of everyday English are being used, a great deal of information

is conveyed.

Using the concept of structural meaning as a starting point, Fries defines grammar as the devices that signal the structural meanings of the language.[1] These devices are absorbed in childhood as an important part of the learning-to-talk process. They achieve signalling significance through the system of contrastive patterns that comprise the language. The basic items of this system are form-classes or parts of speech that must be recognized if the utterance is to have meaning and be unambiguous. For example,

Ship sails today

is ambiguous because we do not know whether ship and sails are, in the language of traditional grammar, nouns or verbs. The word the is needed as a marker before one or other of the first two words to make clear whether a statement or request is intended.

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[1]This approach is in contrast to the traditional treatment of grammar, whereby undifferentiated total meaning is first arrived at, and then technical terms given to segments thereof--as, for example, when we term the doer of the action the subject.

Fries points out the inconsistencies and inadequacies in the traditional approach and attempts to describe all structural signals in physical terms--to arrive at meaning through form rather than form through meaning.

> "As a general principle I would insist that, in linguistic study and analysis, any use of meaning is unscientific whenever the fact of knowing the meaning leads us to stop short of finding the precise formal signals that operate to convey that meaning."
>
> Fries (1952, p. 8)

The ship sails today

or

Ship the sails today

Thus form-classes rather than words as lexical terms are the units of grammar through which structural meaning is conveyed.

> "An English sentence then is not a group of words as words but rather a structure made up of form-classes or parts of speech. In order to know the structural meaning signalled by the formal arrangements of our sentences one need not know* the lexical meanings of the words but he must know the form-classes to which the words belong. Our description of the patterns of devices to signal structural meanings will, therefore, be in terms of the selection of these large form-classes or parts of speech and the formal arrangements in which they occur."
>
> *"Know" in the sense of "respond to".
>
> Fries (1952, p. 64)

Fries proposes four form classes (Class I words, Class II, Class III, and Class IV) roughly, but by no means entirely, corresponding to the traditional nouns, verbs, adjectives, and adverbs, respectively. In accordance with his insistence on making all definitions in descriptive, formal terms, he identifies the parts of speech by the positions they can fill in basic English sentence patterns,[2] assuming that all words that can occupy the same

[2] To be more precise, these patterns are of "single free situation utterances" as defined by Fries (1952, pp. 29-41).

"set of positions" in the three basic test frames he proposes must belong to the same part of speech or form-class. Using these three basic test frames:

Frame A: The concert was good (always)

Frame B: The clerk remembered the tax (suddenly)

Frame C: The team went there

Fries labels all words that could fit into the positions occupied by concert, tax, and team Class I words; all those that could fill the positions of was, remembered, and went Class II words; all those that could fill the position of good and stand between the and concert as in

The (good) concert is/was good

Class III words; and those that could be substituted in the position following the three already explored, Class IV words. Fries finds subgroups of his form-classes in terms of modifications they call for in the basic frames and in terms of the range of positions they can occupy, but these are not significant in the present study.

To all other words, Fries applies the term function words.[3] The basis of this broad classification is that

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[3] An examination of linguistic writings preceding and following Fries indicates that Fries builds on classic linguistic concepts, but adds original material and uses classic terms to suit his own purposes. His use of the word form-class is more restricted than that usual in linguistic writings--Compare Bloomfield (1933, pp. 264-280) and Berko and Brown (1960, p. 548). Bloomfield's class-meaning and grammatical meaning appear more emphatically in Fries as structural meaning. The concept of function words seems to be original with Fries: Hocket (1958) uses Fries' distinction between function words and

these words are carriers of structural meanings and that the structural signals they contain can only be responded to if one knows the words as items. For example, the structural meaning of statement is signalled by the arrangement of Class I and Class II words in the following, regardless of the particular Class I words used:

The men came

They came

Many came

If a nonsense word is substituted, the structural meaning is the same.

Woggles came

But if we substitute the function word who, the structural meaning is changed.

Who came

The question signal is inherent in the word who: no other word, except what or which, and no nonsense word could transmit the same meaning. Even when several function words do signal the same structural meaning, there are no formal contrasts by which we can identify them as belonging to a group with the same structural properties. They must be remembered as items.

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form-classes, but uses the terms functors and contentives, thus avoiding Fries' specialized use of form-class: Roberts (1958) uses the term structure groups instead of function words.

Fries distinguishes fifteen groups of function words on the basis of the positions they can fill in elaborated sentences. He labels them alphabetically from "A" to "O"[4] Group A words, for example, are all those that could fill the position of the in

The concert was good

--and we have no, your, both, John's, all, and so forth. Group B words are all those that could be substituted for may in the following expanded sentence frame:[5]

The concert (may) be good

--and we have can, will, must, should, has (been), and so forth.

Fries notes that the items comprising the function word groups are few in number compared with the thousands of items in the four form-classes. However, the individual function words are used much more frequently than are the individual items of the form-classes. He also notes that it is difficult, if not impossible, to distinguish the lexical meanings of the function words from the structural meanings they signal--witness the dictionary space needed to describe the various meanings of words such as in and since.

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[4]Hockett's subgroups of functors differ from Fries' function word groupings. Roberts (1958) proposes an indefinite number of structure groups, but identifies the main ones by names that indicate their particular functions--determiners, intensifiers, etc.--instead of using Fries' letter names.

[5]Expanded free utterance in Friesian terms.

The Structure of English summarizes the devices by which some of the more important structural meanings are conveyed in English--those that signal sentence kinds, direction of reference in sentence sequences, part-of-speech membership, meanings carried by subjects and objects, meanings carried by modifiers. Response to these structural cues is the subject of this thesis.

CHAPTER II

HISTORICAL BACKGROUND IN PSYCHOLINGUISTICS, GENERAL EDUCATION, AND THE EDUCATION OF THE DEAF

Response to linguistic cues is primarily the concern of psycholinguistics, a relatively new specialty. However, it also has a direct bearing upon applied fields in which problems of language comprehension are central, and the present investigation singles out children's reading and the education of the deaf. A survey of the pertinent literature in these three fields will provide perspective for the study to be presented.

Psycholinguistic Studies

There have been a number of psycholinguistic studies designed to test children's control over linguistic structure--both receptive (their response to the meaning it carries) and expressive (their ability to use items of structure to convey meaning). Some of these studies have been particularly concerned with English morphology (items of word form that convey meaning) and some with syntax (items of word arrangement that convey meaning).

Berko (1958)[6] tested children's knowledge of

[6]Described also in Berko and Brown (1960).

morphological rules by presenting pre-school and first-grade children with pictures labelled with nonsense syllables, and inducing the children to supply inflections and derivations of these words.

Example: "This is a wug.

Now there are two of them.

There are two _____?"

By this general technique, she explored children's implicit knowledge of the plural, possessive, verb, and adjectival inflections, and of the adjectival "y" as in meaty, and the agentive "er" as in teacher.

Brown and Berko (1960) used nonsense syllables to explore children's implicit understanding of cues to part-of-speech membership. They presented 80 subjects (20 adults and the rest children in the first three grades) with nonsense syllables used in sentences that identified them as one of six parts of speech--count noun, mass noun, transitive verb, intransitive verb, adjective, and adverb. The children were asked if they could think what the word might mean. They replied by either supplying an English equivalent or by using the nonsense words themselves in original sentences. Twelve syllables were used in twelve sentences, two being assigned to each part of speech explored. For example, the syllable wug might have been used in one of the following six ways:

"Do you know what a wug is? This is a girl who is thinking about a wug. Can you make up what that might mean? (Count noun)

"This is a cat thinking about some wug." (Mass noun)

"This is a woman who wants to wug something." (Transitive verb)

"Do you know what it means to wug? This is a picture of a little boy who wants to wug." (Intransitive verb)

"This dog is thinking about something wuggy." (Adjective)

"This dog is thinking of doing something wuggily." (Adverb)

The results showed that the children's ability to respond to part-of-speech cues increased with age and varied for the different parts of speech. They apparently recognized count nouns and adjectives more readily than the other parts of speech. These results were confirmed by a word association test conducted at the same time. Younger children tended to give a phrase completion response to the stimulus word, whereas older children and adults tended to respond with a functionally equivalent (paradymic) word; that is, one of the same part of speech). The tendency to respond with a functional equivalent was most pronounced in the case of count nouns and adjectives.

Brown and Berko (1960)[7] report a study by Ervin in 1957 also showing that word associations become increasingly paradymic with increasing age.

Porter (1959) tried to find the cues used by adults

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[7]Also described in Berko and Brown (1960).

and children in identifying verbs. The cues tested were position, the presence of function words establishing the part of speech of other words in the sentence, and verb endings. He presented his subjects with a series of cards, each with a sentence on it. He asked them in each case to guess the word he was thinking of, explaining that it would be a word like the one he pointed to in a sample sentence (that is, the verb). The subjects were then presented with a series of English subject-verb-object statements with varying degrees of adjectival and adverbial modification and containing verb cues of the kinds mentioned above. Their responses were reinforced with "right" or "wrong." Thirty-three nonsense sentences were then presented. They were from three to five words in length and contained various cues to verb identity--position alone, position and verb endings, position and function words, and so forth. Responses on the nonsense sentences were not reinforced, but on every fifth response the subject was asked the reason for his choice. Position proved to be the cue most often used, with function words next, and verb endings least effective. In their verbalizations, however, most subjects explained their choices on the basis of meaning: "...it's the thing they are doing," "it shows action," and so forth. They only revealed their awareness of structural clues in response to further probing.

Still more closely linked with the present study

because it is concerned with the meaning carried by part-of-speech membership, is a study by Brown (1957).[8] He found that parts of speech have fairly reliable semantic implications in child language; nouns tend to refer to concrete objects, verbs to actions, and so forth. He then went on to discover if part-of-speech membership of a new word could indicate its general meaning to children. He used pre-school children and presented to them three sets of four pictures. The first picture of each set showed three salient features--an action, a substance, and an object (for example, hands kneading a substance in a container). Each of the three subsequent pictures in the set duplicated part of the first picture, emphasizing one of its salient features (that is, the action, the substance, or the object). The first picture was shown in conjunction with a nonsense word used as a verb (ing form), a mass noun, or a count noun (for example, sibbing, some sib, a sib) and the children were asked to point out in one of the other pictures what had been named in the first. The success achieved by these young children in this task showed that part-of-speech membership did indeed carry meaning and "could act as a filter, selecting for attention probably relevant features of the nonlinguistic world" (Berko and Brown, p. 552).

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[8]Also described in Berko and Brown (1960).

General Education: Reading

It has been said that reading comprehension must be viewed as the interaction between reading ability and readability--that is, between characteristics of the reader and characteristics of the text (Lorge, 1944). As a prelude to the present study, the investigator examined the literature to see if relations had been established between reading ability and the ability to discern structural meaning, or between readability and the sentence structure of the text.

Investigations into reading ability traditionally relate some measure of the subjects' general reading comprehension, usually obtained from one of the standardized paragraph meaning tests, to variables that range from the general one of intelligence or mental age to specific abilities or characteristics revealed by tests of vocabulary, sentence comprehension, spelling, punctuation, auditory discrimination, visual discrimination, eye movements, personality, and so on (Gray, 1948 to 1960; Traxler, 1941, 1946, 1952). In general, investigators seem to have been as interested in non-linguistic correlates of reading ability as in linguistic. Correlations between reading and intelligence, as measured on verbal tests, range between .68 and .86, but are much lower when intelligence is measured on non-verbal scales (Goodenough, 1925; Strang and others, 1961; Vineland and Massey, 1957). The other measures that show the most

consistently high relations with general reading ability are those of vocabulary (word meaning) and sentence meaning (Gates, 1958; Goodenough, 1925; Hughes, 1953; Lindquist, 1956; Science Research Associates, 1955). Correlations between word meaning and paragraph meaning scores range from the 0.7's to the 0.9's, but drop when mental age is held constant. Correlations between sentence comprehension and paragraph meaning scores are usually in the 0.8's. Success in spelling correlates with paragraph comprehension to about the same degree as does verbal intelligence (Hughes, 1953; Russell, 1943; Strang and others, 1961; Vineland and Massey, 1957). A number of authorities, Betts (1945, 1954), Harris, (1962), Hildreth (1948), McKee (1948) and others, assume a relation between reading ability and general language comprehension or use, although recent teaching texts seem to stress this connection more than those published in the 1930's and early 1940's. Authorities in the field of remedial reading, Betts (1945), Hildreth (1948), Monroe (1932), and others, report general language disability associated with severe reading disability, yet a number of textbooks fail to mention poor language mastery as a factor contributing to reading difficulties. This is the more surprising in that a high correlation has been found between comprehension through listening and comprehension through reading (Larsen and Feder, 1940; Young, 1936), and Durrell (1940) has developed a prognostic test (The Durrell-Sullivan Read-

ing Capacity Test) which uses responses to spoken language as predictors of success in reading.

In spite of these indications and this recognition that reading ability is related to general language comprehension, no attempt seems to have been made to relate paragraph comprehension to a measure of success in discerning structural meanings in the Friesian sense. The correlations most nearly approaching such a measure are those relating paragraph comprehension with sentence comprehension on standardized reading tests (Gates, 1958; Goodenough, 1925). However, the sentence comprehension scores used are based on material that incorporates both lexical and structural meanings, and there is no indication that the sentences were constructed to test comprehension of representative items of linguistic structure. Gibbons (1941) presents some interesting techniques for relating "sentence sense" to general reading ability, but again, lexical meaning is involved. A few studies relate knowledge of grammar or usage to reading ability (Anderson, 1949; Hughes, 1953; Bond, 1940; Townsend, 1954). Strom (1956) gave tests of paragraph meaning, vocabulary, and grammar and syntax, all based on the same selections, to 327 high school sophomores in 15 classes in ten public and private high schools. A significant relation between ability to comprehend the selections and ability to classify crucial elements of grammar and syntax was found for only four of the classes,

and these four classes were from experimental schools in which grammar had been taught in direct relation to written and oral expression. Strom conjectures that the relation might have been caused by the nature of the instruction in grammar and syntax in those particular schools. She does not report whether reading scores for the experimental schools differed significantly from those in the other classes: presumably they did not. The present writer finds no other clearcut correlations between reading ability and grasp of grammar or sentence structure reported in the literature. However, in an interesting factorial analysis of reading ability, Anderson (1949) reports that vocabulary accounted for 57.6 percent of the total variance, intelligence for 13.2 percent, and a factor he calls analysis-synthesis for 29.2 percent. The analysis-synthesis factor was so named because factor loadings were positive on tests of grammar and spelling, and negative on tests of sentence structure and punctuation.

Investigations into readability relate various aspects of a text to the known reading ability of large groups of people who have success with it. The aspects of the text that have been most widely studied and used as predictors of readability are vocabulary load, measured in a variety of ways, structure and style, also variously measured, and human interest, assessed from number of personal pronouns, colorful words, and so forth (Lorge, 1944). Lorge reports

that a reasonably good prediction of readability can be obtained from a weighted composite of vocabulary and sentence structure measures. Of these, the more important is a measure of vocabulary load. The following structural measures have been used by various investigators in this field (Lorge, Flesch, Gray and Leary, Vogel and Washburne, and others) as reported by Lorge (1944):

percent prepositional phrases
percent indeterminate clauses
relative number of simple sentences
average sentence length

Lorge finds these measures so interrelated that any one yields almost as much information as several. While they may be adequate for general predictive purposes, none distinguishes the particular structures with which readers have difficulty.

Also in the field of readability are studies that measure the effect on comprehension when a text is simplified or amplified in various ways. Serra (1953, 1954) reports a number of such studies, most of them unpublished. The various investigators she cites find that simplification of vocabulary alone does not increase comprehension; that reducing the number of concepts per page is important in increasing comprehension; that simplifying sentence structure increases comprehension; and that correct verbalization

is often an erroneous criterion of comprehension. Holland (1933) reports that length and complexity of sentence structure affects comprehension in varying degrees depending on the sentence patterns used, and the individuals and groups involved. These studies do not reveal any detailed, experimentally derived basis for structural simplification of reading materials.

The Education of the Deaf

Deaf children are much retarded in all aspects of language development (Fusfeld, 1954; Myklebust, 1960; Pugh, 1948; Schick, 1936). Expression is defective because the hearing loss drastically interferes with reception of language patterns. Comprehension is poor for the same reason; the child cannot build associations around language that he does not receive. Lipreading skill varies greatly from person to person, and at best the lipreader receives very incomplete language patterns. More crucial than the patterns the child does receive, are those he does not. Since vision is a directional sense, the spoken language that a deaf child receives is for the most part limited to that addressed directly to him, and by this fact alone his language experience is greatly restricted.

The education of the deaf consists mainly of overcoming as far as possible the poverty of language experience that deafness imposes. Because of the limitations of lip-

reading as an input channel, deaf children are early presented with language in written form. The deaf child, at least in the early school years, does not "learn to read" as a distinct enterprise. Rather he learns language through meeting it both on the lips and in print in situations planned to illumine its meaning. Teachers of the deaf differ in respect to the extent to which associations should be built among the various input and output channels, lipreading and reading, speech and writing.

As the child gets older, independent reading becomes his most promising potential means of absorbing new language, but deaf children are on the average much retarded in reading ability. Reporting the results of a five-year program of achievement testing in a school for the deaf, Schick (1936) finds Paragraph Meaning the lowest subtest score on the Stanford Achievement Test, with Word Meaning next. Compared with hearing children of the same age, the deaf showed a median reading retardation on these two subtests of from three to five years, compared with a median overall retardation on all subtests of two years. Retardation increased with age. Fusfeld (1954) reports scores of deaf college applicants on the Stanford Achievement Test, Advanced Battery. He finds Word Meaning lowest and Paragraph Meaning third lowest after Science. Medians for the groups on the Word Meaning and Paragraph Meaning subtests were grade levels of 6.7 and 8.2 respectively. The most comprehensive

study of the reading of the deaf was done by Pugh (1946, 1946, 1948). She gave the Iowa Silent Reading Elementary Reading Achievement Test, the Durrell-Sullivan Reading Achievement Intermediate Test, and the Otis Quick-Scoring Mental Ability Test to between 2000 and 3000 deaf children in the intermediate and upper grades and to control groups of hearing children. In reporting the results, she compares the experimental and control groups on the basis of years in school (from under seven to 13 years), but notes that essentially the same results obtain when comparison is on the basis of age. Pugh's chief findings are as follows:

a. Medians for the deaf were consistently lower than those for hearing children in school for the same number of years.

b. The younger children were less retarded than the older, median retardation on the Iowa ranging from 3.0 for children who had been in school under seven years to 6.8 years for children who had been in school 13 years. Retardation on the Durrell-Sullivan ranged from 2.5 to 6.5 years according to level.

c. Deaf children showed only slight progress in reading from the seventh to thirteenth year in school.

d. Among the various subtests, Sentence Meaning showed greatest retardation on the Iowa Test with Word Meaning next. Paragraph Comprehension and Directed Reading were also weak. Rate, Alphabetizing, and Use of Index were

least retarded. On the Durrell-Sullivan Test, Word Meaning showed slightly less retardation than Paragraph Meaning. Pugh attributes this difference from the Iowa results to the fact that, in the Durrell-Sullivan Test, vocabulary and paragraphs are graded in difficulty.

e. There was a high correlation between "verbal ability" as measured by the Otis test and reading ability, but in some cases reading showed retardation greater than that accounted for by the results of the verbal ability test.

With respect to teaching methods, one of the most influential studies to appear was done by Thompson (1927) in 1922. Prior to that time, deaf children were not usually presented with any language in written form until they could respond to the spoken form through lipreading and had mastered the articulation involved. Using material prepared by Gates, Thompson showed that young deaf children could be taught to associate meaning directly with the printed word. Since then, there has been a strong reactionagainst the previous reluctance to use reading as an input channel in language development. The notion has become widespread that silent reading should go far ahead of the children's ability to express and discuss what they have read. A statement of Alexander Graham Bell's is often used to support this opinion: "I would have deaf children read books in order to learn language, instead of learning language in order to

read books...."[9]

Streeter (1956) analyzed Primary readers for dependent clauses, and thereby pointed out some of the structural difficulties faced by deaf children in the early grades.

Findings on the intelligence of the deaf and its relation to reading and school achievement are pertinent to the present study. The overall performance of the deaf on most non-verbal intelligence scales is equal to the hearing (Schick, 1933; Myklebust, 1960), although they fall significantly below the hearing on certain subtests and on certain scales and tests calling for a high degree of abstraction and reasoning (Oleron, 1950; Myklebust, 1960). The deaf are inferior on verbal intelligence tests. These findings reflect the reciprocal relation of language development and IQ. Verbal IQ and even IQ derived from certain non-verbal tasks is greatly dependent on language skill. Language skill, in turn, is no doubt dependent on learning capacity, but is affected by other factors, such as sensory deprivation. Even with normally hearing children, we cannot know how much IQ is a reflection of language development and how much an explanation of it. Stated in still more general terms, the IQ may be considered as indicating present level of mental functioning; to what extent it also indicates learning

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[9]In a speech delivered at the Sixth National Conference of Superintendents and Principals of Institutions for Deaf-Mutes at Jackson, Mississippi, April 1888. Reported in the Volta Review, December 1922, p. 470.

capacity is uncertain. In the case of the deaf, one would expect the performance IQ to be a truer measure of learning capacity than the verbal, but little relation has been found between performance IQ and school achievement (Brown, 1930; Myklebust, 1960). One explanation is that most performance tests do not measure those aspects of intelligence most critical for the language development upon which school achievement depends, or those mental abilities most adversely affected by retarded language development. Another explanation is offered in the discussion of the results of the present study.

CHAPTER III

PURPOSES OF STUDY: NATURE AND POSSIBLE APPLICATIONS OF NONSENSE TEST

The general purposes of the present study were to investigate the validity and feasibility of paper-and-pencil nonsense-word tests in measuring response to linguistic structure, and to explore the usefulness of such measurement in analyzing the reading problems of normally hearing and deaf children. The more specific goals of the investigation were:

a. To construct a test of the structural component of linguistic meaning divorced from the lexical component, using structural signals described by C. C. Fries (1952).

b. To obtain initial data on internal relations among the test parts, and on external relations between the various test sections and general reading ability.

c. To make a pilot comparison of the role of structural meaning in reading by normally hearing and deaf children.

Nature and Scope of the Test Devised

A Nonsense Test was devised in which nonsense words were used in sentences and short sentence sequences wherever words belonging to Fries' form-classes would ordinarily

occur. By this technique, lexical meaning was as far as possible eliminated. Subjects were required to respond in a variety of ways designed to test their absorption of various structural cues. Specific structural signals described by Fries were used, but not all of the Fries material was included. In general, meanings carried by word arrangement and by function words were more thoroughly explored than meanings carried by word form. In addition to the structural signals suggested by Fries, a few additional cues that occurred to the investigator were included in the test.

The test consists of six sections. The directions for each section and the sample item used in explaining the task to the subjects follow:

Part I -- Sentence recognition

> Use capital letters, periods, and question marks in the following to show where the sentences begin and end.
>
> Example:
>
> a munchment sapled lan did he borgle it

Part II -- Sequence signals

> The sentences in the following groups can be arranged to make a story. Put a number by each sentence to show the order in which it should come to make a story.
>
> Example:
>
> The hort sunged it. ____
>
> Pog abbed a gork. ____
>
> Then the surbles bonched grosply. ____

Part III -- Sentence kinds

Tell whether each of the following sentences is a question, statement, or command.

Example:

Is the fresner storp _____

Hoble the frisp gantly _____

Rarely had the barg norged _____

Part IV -- Parts of Speech

Read the following sentences. What do the underlined words mean? Draw a circle around the meaning you think is right.

Example:

The garble sonned frumptiously.

(lonely, angrily, frightened)

Part V -- Subjects and objects

Read each sentence or group of sentences. Then read the questions about it. Draw lines under the right answers.

Example:

The rog was franted by the purnip.

(a) Who franted something?

(the rog, the purnip, yes)

(b) Did the rog do anything in this sentence?

(Yes, No, We don't know)

(c) What does "franted" mean?

(pushed, fuzzy, frowned)

(d) What does this sentence tell us?

What happened to the purnip

What happened to the rog

What the rog found

Part VI -- Modifiers

Read the sentence and write short answers to the questions about it.

Example:

A burbling fangle gobbed randly into the forstant.

(a) What kind of fangle did something?

(b) How did the fangle gob?

(c) What is the verb in this sentence?

(d) What was the fangle doing when it went into the forstant?

For a detailed description of the test sections and their Friesian background, see Appendix B.

Possible Relevance of Tests of Structural Meaning to the Fields of Psycholinguistics, General Education (Reading), and the Education of the Deaf

It seems to the writer, that tests of structural meaning might be useful tools in several fields. The following possible applications to the fields of psycholinguistics, general education (reading ability, readability, and teaching methods in reading), and the education of the deaf are presented, not as hypotheses being adequately tested in the present, very limited, pilot study, but rather as the kind of speculation that lead to the construction of the Nonsense Test.

Psycholinguistics. The psycholinguistic studies cited in the first section of this thesis use as subjects either young children, children of varying ages, or children and adults, and all seem designed to establish developmental trends in control over linguistic structures and the meanings they convey. Such trends are notoriously difficult to trace amid the lush language growth of the normal child after the initial learning-to-talk stages, and it seems to the writer that the nonsense-test technique holds great promise in this enterprise, particularly if tests suitable for administration to large groups of children can be devised. The test constructed for this study can be used with relatively large groups. It is intended for adults or older children whose command of English structure and its semantic implications may be considered fully developed within the limits set by intelligence, amount and kind of language experience unrelated to age, and other factors affecting linguistic development. It is possible that an instrument of this sort might be used to establish adult norms for receptive control over structural meaning, and that adaptations might be devised to establish norms for children of various ages.

General Education: Reading. Reading is a form of language comprehension, a way of absorbing linguistic meaning. Investigators and educational authorities in reading have placed considerable emphasis on the lexical

component of linguistic meaning commonly termed vocabulary, but very little on the structural component. Among the great mass of reading studies, there seem to be none that clearly measure the relation of reading ability to skill in interpreting representative items of sentence structure. Tests of sentence meaning exist, but they do not seem to rest on a sound theoretical base. As stated previously, they fail to eliminate lexical meaning, and there is no evidence that they systematically explore control over specific structural signals. It seems reasonable that data on such a basic component of the reading process as grasp of structural meaning should take their place with those on vocabulary, intelligence, phonetic skills, eye-movements, spelling, socio-economic background, personality, and the other hypothesized variables that have received attention in the literature. Tests such as the Nonsense Test presented in this study may provide the necessary instruments. Such tests may also be pertinent to the field of readability, providing a basis for both the prediction and the manipulation of text difficulty.

The work of the teacher begins where that of the investigator ends. Teaching techniques advocated by the various authorities on reading do not appear to include systematic teaching of structural cues to meaning. That such teaching might be valuable is suggested by the following quotation from Harris (1962, page 9):

> As the child gets beyond the beginning stages in reading and the task of recognizing words becomes more nearly automatic, he finds his reading material becoming more complicated. Ideas are introduced which are outside the range of his experience and words are employed which he has never heard spoken. Sentences become longer and their structure more complex. Finding out what the book means becomes harder because the language is more involved than the conversation to which the child is accustomed. To keep up with his reading the child must increase his vocabulary, enlarge and refine his store of concepts and ideas, and develop his mastery of more complex forms of expression.[10]

The Harris book is the only one found by this writer to recommend specific exercises for improving comprehension of sentence structure (Harris, 1962, pages 430-431). Diagnostic tests to probe weaknesses in this aspect of reading might be of considerable help to teachers. The concept of the function word, in particular, as distinct from the form-classes, suggests an aspect of vocabulary work that deserves attention. The function words, few in number but high in structural significance, may merit systematic teaching apart from work on general "vocabulary," and nonsense tests may guide this teaching and check on its effectiveness.

The education of the deaf. A common-sense interpretation of reading studies with the deaf is that deaf children do not read well because they do not understand language well, and they do not grow well in language comprehension because they do not read well. Only a deaf child who is

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[10]Italics inserted by this writer.

linguistically gifted or exceptionally well-taught is able to break out of this educationally disastrous circle, and teachers need above all to know the point at which they can most effectively intervene.

In the light of Fries' work, we may speculate as to the relative parts played by lexicon and structure in the reading disability of most deaf children. At the Primary and Intermediate levels, when the children are acquiring their basic language foundation, both aspects of linguistic meaning are taught with equal vigor in most schools. In the upper grades, however, the vocabulary demands of reading materials become so formidable that the teaching of lexical meanings may well engage teachers to the neglect of meanings carried by structure; and the vocabulary lag of the pupils may be so conspicuous that it overshadows deficiencies just as crippling in their ability to interpret complex sentence structure and the cues provided by the all-important function words.

In the opinion of the present writer, unwarranted and over-sweeping generalizations have been made from the Thompson experiment. People do not readily understand reading material that is too far removed from the language they are accustomed to interpret and use in communication with others, whether in everyday conversation or in the give and take of discussion on special subjects. The deaf child undoubtedly benefits from seeing in written form the

language he is required to manipulate in interpersonal communication. However, it is doubtful whether simple, "silent" exposure to complex structure, without discussion and supplementary examples, is sufficient to develop mature reading ability in the average deaf child--reading ability sufficient to become a tool for independent language development. In schools where the dependence of reading on general language development has been recognized, "learning language in order to read" has taken its place with "reading in order to learn language." Discussion that involves not only vocabulary but the structural features of the text is a basic part of the teaching process. The children are required to paraphrase, and to interpret supplementary examples that contain the less common function words and sentence constructions. Tests of control over specific items of structure might help teachers of the deaf to plan this kind of language comprehension program more systematically and effectively, and so improve their pupils' reading ability.

CHAPTER IV

PROCEDURE

Subjects

Children between the ages of 13 and 15 inclusive and of average intelligence or better were used in the study: 59 had normal hearing and 38 were deaf.

The deaf subjects were pupils at two private schools for the deaf in the St. Louis area. At one school, represented by 26 pupils, all the children in the designated age range were used except four whose reading level and general language attainment were below the minimum judged necessary for the tests. At the other school, only the 12 pupils assigned to the two top grade levels were tested. The IQ's of the deaf subjects, as measured by the performance sections of the Wechsler Intelligence Scale for Children (WISC) or the Wechsler-Bellevue Intelligence Scale (WB), ranged from 97 to 136 with a mean of 115.16. Mean age was 14.42.

One group of 35 children with normal hearing were 7th- and 8th-grade pupils[11] at a public elementary school in St. Louis. Mean age was 13.95. IQ's were supplied by the school and ranged from 94 to 123 with a mean of 108.11 as

[11] Eight 7th-grade pupils were added to an 8th-grade class to make up the number of subjects requested.

measured by the Lorge-Thorndike Intelligence Test. The other group of 24 subjects with normal hearing comprised an 8th-grade class at a suburban junior high school in St. Louis County. Their mean age was 13.78 and their IQ's, supplied by the school, ranged from 94 to 155 with a mean of 126.58 as measured by the Henmon-Nelson Intelligence Test. The mean age of the combined hearing group was 13.88 and the mean IQ 115.63.

Tests Used

The Nonsense Test of Structural Meaning as devised by the investigator and described above was given to all subjects.

Reading scores were obtained from the Paragraph Meaning and Sentence and Word Meaning Tests of the American School Achievement Tests (Advanced Battery).[12] These tests are designed for the 7th to 9th grades, but norms are given for the 1st to 11th grades. The Sentence and Word Meaning Test consists of 40 multiple-choice items of roughly increasing difficulty that require recognition of word meaning in a sentence context. Each item consists of a short sentence to be completed with one of four words given after the sentence. The three incorrect choices given are usually

[12]The two deaf pupils who were least advanced were given the reading tests of the Intermediate Battery. It was believed that for these pupils the Intermediate Battery would give a more valid score than the Advanced Battery.

of the same part of speech as the correct one and related in meaning. The Paragraph Meaning Test consists of 14 paragraphs of increasing difficulty followed by two or more multiple-choice questions, a total of 48 items. In some cases the answers are to be found in the reading material; in others they must be inferred.

The norms for the test have been checked on large groups of pupils in grades 1 to 9 from geographically scattered districts representing industrial, rural, and residential areas (Pratt and others, 1958). Scores are expressed as grade levels, a score of 6.2, for example, equalling the median score obtained by pupils in the second month of the sixth grade in the normative population.

Testing Conditions and Procedures

Presentation of the Nonsense Test. The Nonsense Test was administered in a standard way to both deaf and hearing groups. The children were told that they were going to have a reading test that was different from any they had ever had; that most of the words in it would not be real words, but make-believe or nonsense words; that the examiner wanted to see how well they could understand sentences when most of the words were make-believe. The examiner then placed on the blackboard the sentence Woggles ugged, and, by asking "Who ugged?" and "What did Woggles do?", showed the children that they could indeed read and understand, even though they did not know what Woggles or ugged meant.

The instructions and sample items for the different test sections were then presented on large charts, the examiner reading aloud as she ran a pointer under the lines. The children were encouraged to read aloud with her, and were asked to respond to the sample items. The correct response in each case was repeated by the examiner, who then, without actually marking the chart, pretended to record it thereon in the manner called for by the instructions. In the case of Section VI, the examiner wrote the correct answers on the blackboard, pointing out that a complete phrase such as a burbling fangle or a burbling one was more desirable than a single word such as burbling. With these procedures, it was possible to give the same kind and amount of preparation to the deaf and normally hearing groups.

Timing the Nonsense Test. The children were given an hour for the Nonsense Test with no break between sections. Failure to set time limits for the various sections led to elimination in the statistical analysis of those items in Part VI not completed by all the subjects.

The American School Achievement Tests in Reading. These tests were administered at a separate testing session according to the instructions in the accompanying manual (Pratt and others, 1958). They were given a month after the Nonsense Test.

Scoring the Nonsense Test

In scoring the Nonsense Test, values were assigned to each item according to the probability of a correct response. Among the test sections approximately the same ratio was maintained between total possible score and the product of the number of items and the probability of error per item if the subject were guessing.[13] Subjective judgments had to be made in assigning item values for test Sections I and VI because of the theoretically unlimited nature of the response called for.

Section VI of the Nonsense Test was scored in two different ways on the hypothesis that the scores so obtained might be differently related to reading ability as measured by the Paragraph Meaning Test. Close scoring, reported in the results as VIa, gave full credit only to answers judged by the investigator to be what a pupil would say if responding orally to an oral question. Only half credit was given if any element of a complete phrase answer, so defined, was omitted. Loose scoring, reported in the results as VIb, gave full credit for any answer containing in unambiguous form the essential idea called for. The answers assigned full credit under this system were often parts of the test sentences which might have been picked out visually as containing the answers to the questions. Examples of close

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[13] The writer is indebted to Dr. Ira Hirsh of Central Institute for the Deaf and Washington University for this method of arriving at item values.

and loose scoring of a representative item may clarify the underlying principle:

Test Sentence

A nally frave slupped yosily down the ponk.

Question with typical answers scored closely and loosely as described above.

Which frave did something?

	Close scoring	Loose scoring
nally	1	2
a nally	1	2
nally frave	1	2
a nally frave	2	2
the nally one	2	2

CHAPTER V

RESULTS AND DISCUSSION

The means of the hearing and deaf groups on the various measures[14] are presented in Table 1 together with the standard errors of the means. The differences between the means of the two groups and the standard errors of the differences are also given. It will be noted that the means of the hearing are significantly higher than those of the deaf on all the tests except Sequence Signals (II). Differences between the means in favor of the hearing were largest for the following test sections:

Sentence and Word Meaning	12.90 σ_{DM}
Paragraph Meaning	8.92
Modifiers (Close scoring) (VIa)	6.38
Modifiers (Loose scoring) (VIb)	6.11
Sentence Types (III)	5.50
Parts of Speech (IV)	4.74

The reading retardation of the deaf here shown is in general agreement with the findings of Schick (1936) and Pugh (1946).

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[14] In the initial stages of the statistical analysis, the four groups, two hearing and two deaf, were treated separately. When it became apparent, however, that the two hearing and two deaf groups respectively were drawn from the same populations, they were combined and the analysis done on two groups, one hearing and one deaf.

Table 1

MEANS AND STANDARD ERRORS OF MEANS
FOR HEARING AND DEAF GROUPS

Measures	Hearing		Deaf		Difference	σ_{dM}
	Mean	σ_M	Mean	σ_M		
CA	13.88	.07	14.42	.15	.54**	.17
IQ	115.63	1.94	115.16	1.74	.47	2.61
Nonsense Test: Part I Sentence Recognition	19.29	.58	17.11	.57	2.18**	.81
Nonsense Test: Part II Sequence Signals	23.31	.67	23.58	.72	.29	.99
Nonsense Test: Part III Sentence Kinds	30.14	.37	26.47	.56	3.67**	.67
Nonsense Test: Part IV Parts of Speech	44.15	.80	37.47	1.16	6.68**	1.41
Nonsense Test: Part V Subjects and Objects	55.66	1.02	51.00	1.34	4.66**	1.69
Nonsense Test Part VIa Modifiers (Close Sc.)	45.15	1.22	31.55	1.75	13.60**	2.13
Nonsense Test: Part VIb Modifiers (Loose Sc.)	47.69	1.12	35.47	1166	12.22**	2.00
Paragraph Meaning	8.50	.21	5.54	.26	2.96**	.33
Sentence and Word Meaning	9.47	.19	5.52	.24	3.95**	.31

**indicates difference significant at the 1% level of confidence.

Their severe retardation on certain parts of the Nonsense Test suggests that these may measure factors related to reading disability. Their still greater retardation in Paragraph Meaning and Sentence and Word Meaning suggests, as one would expect, the deaf suffer from reading disabilities not measured by the Nonsense Tests, difficulties with lexical meaning being an obvious example.

Correlations among test scores, CA, and IQ for both groups are given in Table 2. Correlations that differ significantly for the hearing and the deaf are indicated and also those that are significant for one group at the 1% level of confidence but not for the other.

The moderate positive correlations between the parts of the Nonsense Test suggest that although they measure, with two or three possible exceptions for the deaf, a common factor or factors, no two measure the same thing. Each appears to serve a distinct purpose--presumably the one its title suggests.

It will be noted that CA shows no correlation or a low negative correlation with the other measures. This finding may be attributed to the restricted age range of the children and the fact that in the eighth-grade classes of hearing children used, the younger children tended to be brighter. The low negative correlation between IQ and CA for the hearing group supports this explanation.

The correlation between Sentence and Word Meaning and

Table 2

CORRELATIONS AMONG TEST SCORES, CA, AND IQ

(Upper figure in each cell for hearing, lower for deaf)

	I	II	III	IV	V	VIa	VIb	CA	IQ	PM	SWM
I		.43‡ .37	.37‡ .36	.41 .67	.59 .53	.55 .59	.52 .54	.37‡ .00	.47‡ .20	.30 .61	.20 .07
II			.35‡ .29	.30 .45	.43‡ .21	.61 .45	.58 .42	-.33 -.04	.50‡ .06	.39† .38	.19 .02
III				.44 .49	.42† .38	.43† .34	.39† .32	-.09 .07	.44‡ .26	.43‡ .28	.35 .41
IV					.49 .51	.51 .67	.52 .62	.01 .00	.43‡ .22	.28 .59†	.51 .60
V						.72 .56	.68 .58	-.26 .12	.47‡ .16	.39† .32	.40 .50
VIa							.95 .98*	-.21 .01	.67‡ .19	.66 .64	.59 .57
VIb								-.20 -.04	.61‡ .18	.68 .54	.55 .49
CA									-.35‡ -.10	.20 -.17	.09 .16
IQ										.68† .39	.61‡ .14
PM											.69 .63
SWM											

Note.- For hearing, r's of .30 or greater significant at 1% level; those of .23 or greater significant at 5% level. For deaf, r's of .41 or greater significant at 1% level; those of .32 or greater significant at 5% level.

* marks correlation significantly greater than corresponding correlation for other group (5% level of confidence).

† marks correlation significant at 1% level when corresponding correlation significant at 5%, but difference does not reach 5% level of confidence.

‡ marks correlation significant at 1% level when corresponding correlation not significant.

Paragraph Meaning for the hearing group is somewhat lower than those appearing in the literature (.69 compared with .80 or higher). This correlation has not been reported for the deaf, but in this study it does not differ from that for the hearing.

It will be noted that IQ correlates positively with all tests for the hearing but not for the deaf. The low correlation between Paragraph Meaning and IQ for the deaf confirms previous studies of IQ and school achievement (Brown, 1930; Myklebust, 1960). A probable explanation is that performance tests are used to measure intelligence with the deaf, and that these do not measure verbal skills. If we regard intelligence as learning capacity rather than present level of mental functioning, one possible inference we may draw from the lack of correlation between performance test results and academic progress, including reading skill, is that performance tests do not measure those aspects of intelligence most necessary for growth in verbal ability. This inference is partially supported by the fact that performance tests correlate with various verbal skills less highly than do verbal tests for normally hearing people. However, the almost complete lack of relation between performance IQ and reading for the deaf calls for further explanation. The present writer finds it in the concept of limiting factors. According to this theory, reading and other verbal skills vary with IQ for the normally hearing

because for these children intelligence is a major factor limiting linguistic development: their language performance is normally near the limits set by intelligence. For the deaf, on the other hand, poverty of language experience is the chief factor limiting linguistic growth, with intelligence usually more than adequate for the language level at which the children are functioning. A second possible inference we may make, therefore, is that reading and other verbal skills do not vary with IQ for the deaf because, owing to the children's language deprivation, they are far below the limits set by learning capacity.

Among the other differences in correlations for the hearing and deaf groups, those involving Paragraph Meaning are of particular interest in this study. In speculating upon these differences, we may regard the various sections of the Nonsense Test as primarily measures of the particular language skills their titles suggest--skills directly reflected in the Paragraph Meaning scores; or we may regard them as measures of more general abilities underlying performance on both the Nonsense Test sections and the Paragraph Meaning Test. For example, Sentence Kinds (III) is significantly related to Paragraph Meaning for the hearing, but not for the deaf. In this test section, a large proportion of the items presented no difficulty to either the hearing or the deaf children. Three or four items of medium difficulty were missed by children in both groups. Three

items were so difficult that only a few of the hearing children and none of the deaf children got them right. If we regard recognition of sentence kinds as a skill directly affecting Paragraph Meaning scores, we may suppose that the deaf, for reasons other than deficiency in this skill, are reading below the level at which it is critical: variations in this ability are overlaid by more fundamental or pervasive reading difficulties. For the hearing children, however, reading at a more advanced level, failure to interpret one of the more difficult patterns such as What was in it the boys didn't know as a statement rather than a question may make a difference in reading score. If, on the other hand, we regard both Sentence Kinds and Paragraph Meaning as reflecting a common, underlying language ability, we may say that success with the more difficult items on the Sentence Kinds test demonstrates superior language ability that is also reflected in superior reading ability--a language and reading ability not achieved by any of the deaf children.

The relations of Parts of Speech (IV) with Paragraph Meaning show a lesser difference in the other direction: the correlation for the deaf is significant at well beyond the 1% level, that for the hearing at the 5% level. A considerable number of hearing children reached maximum on this test, the mean for the hearing was higher, and the distribution of scores less scattered than in the case of

the deaf. If we adopt the specific-skill point of view, we may assume that for most hearing children, skill in implicit part-of-speech recognition is comfortably above the level of proficiency needed for adequate paragraph reading: lexical cues not available to the deaf probably supplement their responses to structural cues, and other skills, higher on the language development scale, probably exert more influence on reading scores. For the deaf, on the other hand, part-of-speech recognition may be a limiting factor in reading ability: with fewer lexical cues to help, their proficiency in this skill may be so low that reading ability pushes against it, as it were, and so we find Paragraph Meaning varying with Parts of Speech. Again, if we adopt the underlying-factor viewpoint, we may assume that for the deaf, who are functioning at a comparatively low language level, score variations on the Parts of Speech test represent variations in language ability that are also reflected in Paragraph Meaning scores. For the hearing, on the other hand, functioning at a much higher language level, errors on the Parts of Speech test may be due to mere carelessness or difficulty with the nonsense-word technique.

In Table 3 the correlations of the various measures with Paragraph Meaning for the two groups of subjects are compared. It will be seen that for the hearing, no significant differences were found among the correlations of Modifiers (Close, VIa, and loose, VIb, scoring), IQ, and

Table 3

COMPARISON OF CORRELATIONS OF VARIOUS MEASURES WITH PARAGRAPH MEANING

(Upper half of each cell for hearing, lower for deaf)

	I	II	III	IV	V	VIa	VIb	CA	IQ	SWM
I						**	**		**	
II	†			†		** †	** †		**	†
III						*	*		*	
IV						**	**		**	**
V	†			†		** *	** †		**	** *
VIa										
VIb						**				
CA	‡ ‡	‡	‡	‡	‡	‡ ‡	‡ ‡		‡	‡ ‡
IQ	†			†		†	†			†
SWM										

Note.- Symbols indicate that measure in vertical column correlates more highly with Paragraph Meaning than measure in horizontal column.

** Difference significant at 1% level of confidence.

* Difference significant at 5% level of confidence.

† Correlation in vertical column significant at 1% level when correlation in horizontal ~~column~~ row significant at 5% but difference does not reach 5% level of confidence.

‡ Correlation in vertical column significant at 1% level when correlation in horizontal ~~column~~ row not significant.

Sentence and Word Meaning with Paragraph Meaning. However, Modifiers (VIa and VIb) and IQ are more highly related to Paragraph Meaning than are the following:

Sentence Recognition (I) - Difference significant at the 1% level of confidence

Sequence Signals (II) - 1% level

Sentence Kinds (III) - 5% level

Parts of Speech (IV) - 1% level

Subjects and Objects (V) - 1% level

For the deaf, also, Modifiers (Close, VIa), and (loose, VIb, scoring), and Sentence and Word Meaning are substantially and equally[15] related to Paragraph Meaning, but so, too, are Sentence Recognition (I) and Parts of Speech (IV). We may regard with more confidence the relations of these five measures with Paragraph Meaning than the relations of Sequence Signals (II), Sentence Kinds (III), Subjects and Objects (V), and IQ. These findings with regard to Sentence Recognition (I) and Parts of Speech (IV) tend to confirm their comparatively high relations with reading for the deaf already suggested in Table 2.

The substantial correlation of Modifiers (VIa and VIb) with Paragraph Meaning for both the hearing and deaf groups is particularly interesting. Previous studies, cited above,

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[15] An exception is the difference between the correlations of Modifiers (Close scoring) and Modifiers (Loose scoring) with Paragraph Meaning discussed below.

have shown vocabulary, sentence meaning, IQ, and spelling to be the measures most highly related to reading ability. In the present investigation, the Modifiers (VIa and VIb) section of the Nonsense Test of Structural Meaning is equally so. However, since this is the only section of the Nonsense Test calling for original language responses from the children, we may ask how much of this comparatively high relation with reading is due to the importance of being able to interpret sentences containing modifiers, and how much to the nature of the response called for. It is interesting in this regard that, for the deaf, the results of close scoring on the Modifiers test (VIa) correlate more highly with Paragraph Meaning than do the results of loose scoring (VIb). We may conjecture that the correlation of loose scoring with Paragraph Meaning indicates the proportion of the variance in the reading scores related to skill in interpreting modifiers, and that the difference between the correlations of VIb and VIa represent an additional or overlapping variable. For the deaf, at least, the type of response called for seems to be a significant variable. For the hearing, however, the results of close and loose scoring are equally related to Paragraph Meaning scores, and any influence exerted by the kind of response required overlaps that of the basic test task, the interpretation of modifiers. If we use an underlying-factor explanation in interpreting these findings, we may assume that the language responses of the deaf indicate variations in language ability that are also reflected

in reading. Deaf children, knowing their weakness, are language conscious: in a test situation, they would try to use "good language," but only the more linguistically advanced would be successful. Hearing children might take the tester's injunction to use complete phrases more lightly, and so their responses would not be a true indication of their language ability. The findings with regard to close and loose scoring of the Modifiers test are also open to more specific interpretations that hypothesize a cause and effect relation between the children's language responses and reading ability. In the first place, the writer is encouraged in the belief that good expressive language is conducive to efficient reading. It is also tempting to make a hypothesis regarding the sensory and central processes underlying the responses that received full credit by close scoring and those that received full credit by loose scoring only. We may conjecture that the former are essentially temporal in nature, being mediated by central processes resting upon hearing, the temporal sense. On the other hand, those that received full credit with loose scoring only seem to be essentially spatial, resting upon vision, the spatial sense. If we accept the proposition that a difference in the results of close and loose scoring indicates a tendency to deal with language in a visual-spatial rather than an auditory-temporal way, the higher correlation of close scoring with reading ability also suggests that the auditory-temporal habit may be conducive to better reading,

at least during the early stages of language and reading development at which the deaf are functioning. For the hearing children, functioning at a higher level, the auditory approach to reading seems to have no advantage over the visual.

In Table 4, the correlations of the various measures with Sentence and Word Meaning are compared. Each symbol indicates that the measure in the vertical column correlates more highly with Sentence and Word Meaning than the measure in the horizontal column. In addition, comparisons were made between the correlations of IQ with Paragraph Meaning and Sentence and Word Meaning. IQ correlates equally with the two reading measures for the hearing. For the deaf, it shows a low correlation significant at the 5% level of confidence with Paragraph Meaning, but none with Sentence and Word Meaning. It would seem, then, that the same large language factor or factors underlies performance on the two reading tests and on the verbal intelligence tests used with hearing children.

The correlations of each section of the Nonsense Test respectively with Paragraph Meaning and Sentence and Word Meaning were compared, and the following differences were revealed:

a. Sentence Recognition (I) and Sequence Signals (II) correlate significantly with Paragraph Meaning, but not with Sentence and Word Meaning for both groups of children.

Table 4

COMPARISON OF CORRELATIONS OF VARIOUS MEASURES WITH SENTENCE AND WORD MEANING

(Upper half of each cell for hearing, lower for deaf)

	I	II	III	IV	V	VIa	VIb	CA	IQ	PM
I			‡ ‡	‡ ‡	‡ ‡	‡ ‡	‡ ‡		‡	‡ ‡
II			‡	‡	‡	‡	‡		‡	‡
III						*				
IV										
V						*				**
VIa										
VIb						**				
CA			‡ ‡	‡ ‡	‡ ‡	‡ ‡	‡ ‡		‡ ‡	‡ ‡
IQ			‡	‡	‡	‡	‡			‡
PM										

Note.- Symbols indicate that measure in vertical column correlates more highly with Sentence and Word Meaning than measure in horizontal column.

** Difference significant at 1% level of confidence.

* Difference significant at 5% level of confidence.

† Correlation in vertical column significant at 1% level when correlation in horizontal column significant at 5% but difference does not reach 5% level of confidence.

‡ Correlation in vertical column significant at 1% level when correlation in horizontal column not significant.

b. For the hearing, Parts of Speech (IV) correlates more highly with Sentence and Word Meaning than with Paragraph Meaning (5% level of confidence).

c. For the deaf, Sentence Kinds (III) correlates with Sentence and Word Meaning but not with Paragraph Meaning.

These findings may be pertinent to the question of what the various sections of the Nonsense Test in fact measure. Are they only measures of the particular skills they were designed to measure, or are they also valid indicators of general language development? It seems reasonable to suppose that the test sections which correlate more highly with one of the reading tests than with the other measure relatively specific abilities, whereas those that correlate substantially with both Paragraph Meaning and Sentence and Word Meaning are also indicators of general language development. If this theory is correct, Modifiers (VIa and VIb) may be regarded as a sensitive indicator of general language development for both the hearing and deaf children. Sentence Kinds (III) and Subjects and Objects (V), which, for the hearing, show an equal but low correlation with both Paragraph Meaning and Sentence and Word Meaning, probably measure relatively specific language factors underlying both reading tests, but ones that are not highly indicative of overall linguistic ability for hearing children in their early teens. Sentence Recognition (I), Sequence Signals (II),

and Parts of Speech (IV) seem to measure still more specific skills, and the logic of the respective differences in their relations with Paragraph Meaning and Sentence and Word Meaning is apparent. It is easy to see why Sentence Recognition (I), which may be interpreted more loosely as word grouping, and Sequence Signals (II) should relate to the ability to comprehend paragraphs but not to the ability to understand vocabulary items in single sentences. In the other direction, we can see that Parts of Speech (IV) bears more resemblance to a vocabulary test in a sentence setting than to a test of connected reading. The fact that this test relates equally to both reading tests for the deaf makes us suspect that for these children it is also a test of general language development.[16] It is more difficult to see why Sentence Kinds (III) should show a significant correlation with Sentence and Word Meaning for the deaf, when it does not with Paragraph Meaning. In this case we may suspect that, in spite of the different relations with the two reading tests, a general language factor is involved--one that is revealed when test items are single sentences, but disguised, overlaid with other weaknesses, when paragraph reading is required.

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[16] See previous discussion of this test section above.

CHAPTER VI

SUMMARY AND CONCLUSIONS

An attempt was made to probe the validity and feasibility of paper-and-pencil nonsense-word tests in measuring response to linguistic structure, and to explore the usefulness of such measurement in analyzing the reading problems of normally hearing and deaf children.

A six-part Nonsense Test of Structural Meaning was devised to measure response to structural clues to sentence meaning. Specific structural signals described by C. C. Fries were used. The test sections were as follows:

Part I -- Sentence recognition
Part II -- Sequence signals
Part III -- Sentence kinds
Part IV -- Parts of speech
Part V -- Subjects and objects
Part VI - Modifiers

The Nonsense Test was given to 59 normally hearing and 38 deaf children between the ages of 13 and 15 inclusive and of normal intelligence or better. The children were also given the reading sections (Sentence and Word Meaning and Paragraph Meaning) of the American School Achievement Tests.

A scoring technique was introduced to explore possible effects on reading of auditory-temporal and visual-spatial ways of dealing with language.

The statistical analysis of the results was designed to establish internal relations among the parts of the Nonsense Test and external relations between the various Nonsense Test sections and general reading ability, and also to compare the role of structural meaning in the reading of the normally hearing and deaf subjects. Correlations among the parts of the Nonsense Test were obtained as well as correlations between each test section and the two reading tests (Table 2). Differences among the correlations of the Nonsense Test sections with the reading tests were tested for significance (Tables 3 and 4). The performance of the normally hearing and deaf subjects on all tests were compared (Table 1). Differences between the normally hearing and deaf groups as to the correlations of the Nonsense Test sections with one another and with the reading tests were tested for significance (Table 2).

The results seem to show that paper-and-pencil nonsense tests can be used to test the structural component of linguistic meaning with large groups of hearing and deaf children in their early teens.

With respect to the Nonsense Test devised for this study, each part appears to measure a distinct skill as well as a common factor or factors: the various sections seem to

be valid measures of the skills they purport to test. In addition, the Modifiers section (VI) seems to be a good indicator of general language development, and, for the deaf, the Sentence Recognition (I) and Parts of Speech (IV) sections seem suited for the same purpose. For hearing children, the Modifiers section of the test (VI) correlates most highly with general reading comprehension as measured by a standardized test of paragraph meaning, and appears to be as valid a predictor of reading ability as intelligence or performance on a standardized sentence and word meaning test. For deaf children, the Sentence Recognition (I) and Parts of Speech (IV) sections of the Nonsense Test correlate as highly as the Modifiers section with paragraph reading, and these three sections of the Nonsense Test predict reading skill as adequately as the sentence and word meaning test.

For hearing children in their early teens, reading ability seems to be substantially and equally related to

a. intelligence.

b. ability to comprehend the lexical meaning of words in context (vocabulary).

c. ability to interpret sentences containing modifiers.

For deaf children of the same age, reading ability seems to be substantially and equally related to

a) ability to comprehend the lexical meanings of words in context (vocabulary).

b) ability to group words into meaningful units (sentence recognition).

c) ability to recognize implicitly part-of-speech membership.

d) ability to interpret sentences containing modifiers.

There is also evidence that, for deaf children, reading comprehension is related to skill in expressive language, especially to the ability and/or tendency to respond to the printed word in the same way as to the spoken; to deal with written language in an auditory-temporal rather than a visual-spatial manner.

These results lead the writer to regard pencil-and-paper nonsense-word tests as a promising psycholinguistic tool for establishing norms and tracing patterns in normal and abnormal language development. They also suggest that nonsense tests deserve the attention of testers and teachers who are interested in diagnosing and overcoming the reading difficulties of both normally hearing and deaf children. In the education of the deaf, particularly, extensive testing of the meaning carried by linguistic structure may help in tracing and categorizing the children's language growth and in devising better ways to nurture it.

APPENDIX A

NONSENSE TEST OF STRUCTURAL MEANING

NONSENSE TEST OF STRUCTURAL MEANING

Date:_____ Name:_____ Age:_____

Birthday:_____ School:_____ Grade:___.

Part I

Use capital letters, periods, and question marks in the following to show where the sentences begin and end.

1. sip urted the pance around the craw

2. the broog sumped ristily after that it trunded through the bine a nerg blogged it but it findled oust

3. a puggle ust in the oodle did the sood lunt it the freet didn't

4. mag the prond the trone will soon nerge

5. if the hist hibbles the wask will bast tround

6. although the vert is lug no ibbles can perve it the bosk however can

---

Part II

The sentences in the following groups can be arranged to make a story. Put a number after each sentence to show the order in which it should come to make a story.

Example:

It untrubbled in the flump.___
Brontny uptioned a ginkle.___
It blabed there for a booge.___

1. He pated fash, too.___
2. Rep gogged the ug liddle.___
3. The roch pated him.___

2. Esto tad the raddle in the rave.___
The pud looshed a raddle.___
That rave was very yonk.___

3. Lat ust another one.___
Someone else purved.___
Tog ust a lenk.___

4. Tam shobe the ask nugly.___
   Afterwards a burtle dast.___
   That burtle soonged him.___

5. The tigs gogged, however.___
   He hoshed it, too.___
   The rabe mogged the munt.___

6. Ishly regged there.___
   Burstly wased in the ist.___
   Furthermore, Disty loped bistly.___

7. Therefore, the pend remooged.___
   Onk strunned them.___
   The grindle sempt some prads.___

8. Brunk strubbed some hort.___
   Then the mong finged sunchously.___
   The pondle hurbled it.___

Part III

Tell whether each of the following sentences is a question, statement, or command.

1. The ast oogled istly _____
2. Did Bosna slurd Insk _____
3. When will the targle bossen _____
4. Here is Sobra's vicken _____
5. Purd the sunts istly _____
6. Have the rup penst _____
7. Where is the quert _____
8. Never has the pindle baged _____
9. With whom did the kunt gorble _____
10. Himp in the groast. _____

11. Is the flonk sernt _____

12. Will the honts mage _____

13. There was some brooze in it _____

14. Which deens will hollup _____

15. What mained _____

16. What Blub will flum isn't nictable _____

17. Should the mugs moble, Dipsy will roid _____

18. Which will scurm hasn't been acrunded _____

Part IV

Read the following sentences. What do the underlined words mean? Draw a circle around the meaning you think is right.

1. The urst was omft. (dog, ugly, very)

2. Combles smarked a tist. (comb, Jimmy, comes)

3. Some craiks sumpled rumpf. (rose, ride, yesterday)

4. Osk esk tonker than inst. (father, fatter, matter)

5. The reet's frag was strub. (boy, right, meet)

6. Bock is abble smonged. (apple, cold, nearly)

7. Doff slucked a barp. (there, plum, nice)

8. Bobe's turg was frond. (cute, frown, quickly)

9. Urst some rupes tonded bont. (rule, rude, people)

10. Four steapies may tuckle my proddle. (finish, soom, come)

11. Marfia is more tonable than the poof.
(tractors, answered, excited)

12. Braze endles sometimes. (puddles, comes, makes)

13. The dondles pont a rente pog. (nice, nearly, there)

14. Sup est rather purg. (tired, push, girl)

15. Boos has stullen a nosen. (colored, short, roses)

16. Tunty is more lonkly than the teave. (quiet, today, cat)

17. The tussies may stite around that garber. (nicer, time, broken)

18. The trants prontly sippled it. (quickly, prickly, proud)

19. Bittle the torps. (Betty, get, quickly)

20. In Nipe garps gubble. (Post Dispatch, February, Monday)

21. The ginks forbed in the hoshment. (made, forest, waited)

22. There frobes Tinky. (fronts, gave, goes)

23. There was rubst on his tob. (rubbed, spot, jam)

24. What smore will rable? (chair, is, smooth)

25. Never est Ponty more frapable. (made, was, will)

Part V

Read each sentence or group of sentences. Then read the questions about it. Draw lines under the right answers.

1. Slub rabed the ish.

(a) What does "rabed" mean? (went, hurt, cried)
(b) Who did something? (Slub, the ish, rabed)
(c) What did something rabe? (Slub, the ish, yes)
(d) Did Slub do anything? (Yes, No, We don't know)
(e) Did the ish do anything in this sentence? (Yes, No, We don't know)

2. A lattle is a sig.

(a) What does this sentence tell us?
what a lattle is
where a lattle went
who is big

(b) Did the lattle do anything in this sentence?
(Yes, No, We don't know)
(c) Is a sig the same as a lattle? (Yes, No, We don't know)

3. A pag slooped the marve a gurble.

(a) Who did something? (a pag, the marve, a gurble)
(b) What does "slooped" mean? (saw, made, went)
(c) What does "marve" tell us?
what slooped something
for whom somebody slooped something
where somebody slooped
(d) What did somebody sloop? (a pag, the marve, a gurble)

4. A claub is rasful.

(a) What does this sentence tell us?
what a claub did
something about a claub
that a claub is the same as a rasful
(b) What does "rasful" mean? (cold, milk, tomorrow)
(c) Did the claub do anything in this sentence?
(Yes, No, We don't know)
(d) Is a claub a person? (Yes, No, We don't know)

5. The trib was laven a lug.

(a) What does this sentnece tell us?
what the trib did
what the trib was
what happened to the trib
(b) What does "laven" mean? (broken, loud, given)
(c) Did the trib do anything in this sentence?
(Yes, No, We don't know)
(d) Did the lug do anything? (Yes, No, We don't know)
(e) What happened to the lug?
The trib broke it.
Somebody gave it to the trib.
It was laven.

6. When the tondle niped, the pardles dormped it the lig.

(a) What does "dormped" mean? (saw, was, made)

(b) What did someone do to the tondle?

niped it

dormped it the lig

pardled it

(c) Who became the lig? (the tondle, the pardles, the dormp)

7. The menge, a rast, iggled down the laffy.

(a) What does this sentence tell us?

that the menge was the same as a rast

that the menge saw a rast

that the rast saw a menge

(b) Did the menge do anything in this sentence?

(Yes, No, We don't know)

(c) Did a rast do anything? (Yes, No, We don't know)

(d) Is a laffy an animal? (Yes, No, We don't know)

8. Mullers were poken by the fistments.

(a) What does "poken" mean? (horses, smiled, hit)

(b) Who did something? (the mullers, the fistments, poken)

(c) What does this sentence tell us?

what the mullers did

that the mullers were people

what happened to the mullers

9. Pabby donked a wainsen in the glob. He streeved the glob wainsen in the turberment.

(a) What does this sentence tell us?

which wainsen someone streeved

which glob someone streeved

which turberment someone saw

10. A gab was lanning in the carf. He gumphed a trig. The gab sempt the trig lan.

(a) What did the trig do? (lanned, sempt, gumphed)

(b) What does "sempt" mean? (some, made, hurt)

(c) What does this story tell us?

what happened to the gab

what the trig did to the gab

what the gab did to the trig

Part VI

Read each sentence and write short answers to the questions about it.

1. A nally frave slupped yosily down the ponk.

(a) Which frave did something? _____

(b) How did the frave slup? _____

(c) What was nally? _____

2. The prag downstairs will clomb in the sast.

(a) Where is the prag? _____

(b) Which prag will go somewhere? _____

(c) Who will clomb? _____

3. The igging nabe alped into the yost.

(a) What was the nabe doing? _____

(b) Which nabe went somewhere? _____

(c) What do you think "alped" means? _____

4. The tribble munctioning in the torp gocked into the trist.

(a) Which tribble did something? _____

(b) What gocked into the trist? _____

(c) What was munctioning? _____

(d) Where did the tribble go? _____

(e) Where was something munctioning? _____

5. The gorbed slame rappled there iggly.

(a) What had happened to the slame? _____

(b) What did the slame do in this sentence? _____

(c) What is the verb in this sentence? _____

(d) Did the slame gorb someone? _____

(e) Where did the slame do something? _____

6. The mape borbed by the slink soon hust.

(a) What hust? _____

(b) What had happened to the mape before? _____

(c) What did the slink do? _____

(d) What happened soon? _____

7. The wittal with whom I pamed the crore beraved noctly.

(a) Who beraved noctly? _____

(b) With whom did I pame the crore? _____

(c) Which wittal did something? _____

8. The cruntly loap by the quog will cust to the fustance.

(a) What will happen? _____

(b) What is by the quog? _____

(c) Which loap will do something? _____

(d) Where is the loap? _____

(e) What kind of loap is this sentence about? _____

9. Pont rovled the binger that Fag werned.

(a) What did Fag wern? _____

(b) On the lines below, tell two things that happened to the binger.

_____

_____

(c) What binger is this sentence about? _____

10. The sorgle fent the traze that afterwards jambled Sig.

(a) What happened to the traze? _____

(b) Who jambled Sig? _____

(c) Who was fent? _____

(d) Which traze is this sentence about? _____

(e) When did the sorgle do something? _____

11. The droo when Los planked was frint.

(a) What was frint? _____

(b) On what kind of droo did Los do something? _____

(c) When did Los plank? _____

12. The dros in which the fummer reasled was very ruptious.

(a) What was ruptious? _____

(b) Where did the fummer reasle? _____

(c) What is the main verb in this sentence? _____

(d) In what kind of dros did the fummer do something? _____

_____

(e) How ruptious was something? _____

13. Pumpton mugged the rased frimp rather bostily.

(a) What did Pumpton mug? _____

(b) How bostily did he do it? _____

(c) What had been rased? _____

(d) Was the frimp mugged by Pumpton? _____

(e) Who rased the frimp? _____

14. The pamp seegly ores from asp to losk.

(a) What ores? _____

(b) How does it ore? _____

(c) How long does it ore? _____

15. Cam trosped after the hoog munced.

(a) When did Cam do something? _____

(b) Who munced? _____

(c) Who did something first, Cam or the hoog? _____

16. The slepton was too banful to obset.

Did the slepton obset? _____

17. The florb asped as sunctiously as the strundle.

(a) How did the florb do something? _____

(b) Did the florb asp? _____

(c) Did the strundle asp? _____

18. The isp is orger than poggy can flabble.

(a) How org is the isp? _____

(b) Can Poggy flabble the isp? _____

APPENDIX B

BACKGROUND AND CONSTRUCTION OF THE NONSENSE TEST SECTIONS

BACKGROUND AND CONSTRUCTION OF THE NONSENSE TEST SECTIONS

Part I: Sentence Recognition

Friesian Background

The materials of Fries' investigation into structural meaning were "some fifty hours of mechanically recorded conversation...in which the participants were entirely unaware that their speech was being recorded" (Fries, 1952, page 3). His first task was to mark off this material into sentences. For this purpose, he rejected the usual definitions of a sentence as a unit of meaning, and started instead with a definition from Bloomfield:

> "...each sentence is an independent linguistic form, not included by virtue of any grammatical construction in any larger form."
>
> (Bloomfield, 1933, page 170)

Using this definition, Fries' task was to find inductively the grammatical constructions whereby certain linguistic forms are included in larger linguistic forms, and so to distinguish as sentences those forms not so included.

Fries first broke his material into utterance units, which he defines as "chunks of talk that are marked off by a change of speaker" (Fries, 1952, page 23). He divided his utterance units into situation utterances, or those initiating conversations, and response utterances, or those

given in response to previous remarks. He assumed that situation utterances could stand alone, but that response utterances might not always be able to do so. He also assumed that all situation utterances must consist of one of the following:

a. A single minimum free utterance (the simplest kind of sentence).

b. A single expanded free utterance (an elaborated sentence).

c. A sequence of two or more free utterances (that is, a series of sentences).

Fries separated the single free utterances from sequences of free utterances by "seeking recurrent partials" (Fries, 1952, page 39) by means of a long process of comparing each utterance unit with many others. He does not describe the "recurrent partials" which he found.

The Test Section

Part I of the Nonsense Test measures sentence recognition--the ability to distinguish between single free utterances and series of free utterances. The children are required to demonstrate the extent to which they have absorbed the "recurrent partials" that signal a free utterance, by inserting punctuation marks and capital letters to mark respectively the end of one sentence and the beginning of another. In one or two instances, a sentence sequence could be broken up in more than one way, and in these cases credit was given for any correct response.

Part II: Sequence Signals

Friesian Background

When sequences of free utterances occurred, Fries found that all but the initial one contained sequence signals that tied them to preceding utterances. These sequence signals all look back to the preceding sentence, and it is this direction of reference rather than the lexical meanings of the particular words involved that constitute the structural meaning sequence sentence.

> "The various practical connections between sequence sentences and those that precede them are matters of the lexical content of the items that serve as sequence signals; the structural meaning is the particular direction of the connection."
>
> (Fries, 1952, page 252)

Fries noted the following types of sequence signals, or markers of sequence sentences as distinct from initial sentences:

1. Class I substitutes--personal and indefinite pronouns.

(Situation sentence)	(Sequence sentence)
The boy has just brought the evening paper.	It is at the door.
The houses we saw didn't impress us particularly.	Each had some advantages. Both had disadvantages.

2. The so-called definite article and demonstratives.

(Situation sentence)	(Sequence sentence)

A policeman has just brought in a man, a woman, and three children.	<u>The</u> policeman is making his report now. <u>The</u> man is over there.

3. Free combinations with <u>else</u> and <u>other</u>.

(Situation sentence)	(Sequence sentence)
R___ says the committee is going to consider only budget matters today.	<u>Everything else</u> must wait.
Mr. W___ asked us to meet in his office tomorrow at nine.	I think <u>some other place</u> would be better....

4. So-called adverbs (<u>then</u>, <u>afterwards</u>, <u>thereafter</u>, <u>meanwhile</u>, <u>later</u>, <u>earlier</u>, <u>since</u>, <u>before</u>, <u>there</u>, and so forth). At the beginning of a sentence, and sometimes at the end, these words operate as sequence signals rather than as ordinary modifiers of a Class 2 word.

(Situation sentence)	(Sequence sentence)
During their first weeks at the camp, the men stayed around the fire until nearly midnight.	<u>Later</u> they went away early in the evening.

5. So-called conjunctions (<u>however</u>, <u>yet</u>, <u>nevertheless</u>, <u>also</u>, <u>moreover</u>, <u>besides</u>, <u>therefore</u>, <u>thus</u>, and so on).

(Situation sentence)	(Sequence sentence)
Our rented typewriters are in pretty bad shape.	<u>Besides</u> we need at least one with a longer carriage.

The Test Section

Part II of the Nonsense Test tests the subject's ability to distinguish sequence sentences from initial sentences by recognition of sequence signals of the various types described above. The test is composed of eight different sentence groups of three sentences each, and the task is to arrange the sentences in each group "in the right order to make a story." The sequence signals used in the sentence groups are as follows. The type numbers refer to the foregoing analysis of sequence signals.

Group 1:	First sentence	He (Type 1)
		too (Type 5)
	Third sentence	him (Type 1)
Group 2:	First sentence	the (Type 2)
	Third sentence	that (Type 2)
Group 3:	First sentence	another one (Type 3)
	Second sentence	someone else (Type 3)
Group 4	Second sentence	Afterwards (Type 4)
	Third sentence	That (Type 2)
		him (Type 1)
Group 5:	First sentence	however (Type 5)
	Second sentence	He (Type 1)
		it (Type 1)
		too (Type 5)
Group 6:	First sentence	there (Type 4)
	Third sentence	Furthermore (Type 5)
Group 7	First sentence	therefore (Type 5)
	Second sentence	them (Type 1)
Group 8	Second sentence	then (Type 4)
	Third sentence	it (Type 1)

Part III: Sentence Type from Formal Arrangement of Elements

Friesian Background

Fries found that statements, questions, and requests could be distinguished both by the type of response they elicited from the person addressed, and by characteristic structural and intonation patterns. No attempt has been made in the Nonsense Test to test recognition of sentence type from response elicited, and it would be impossible on a paper and pencil test to measure meaning carried by intonation: therefore, this section is concerned only with the structural patterns that Fries found to be associated with the three sentence types. He found the following basic patterns and variations:

1. Basic sentence patterns.

Statement	Class 1 ⟷ Class 2[17]	The boys came
Request	Class 2 (simple, unchanging form alone or followed by a Class 1 word not tied to it by concordance of form	Come Lift the table
Question	Class 2 ⟷ Class 1	Have they any butter[18] Are they ready

[17] The symbol ⟷ indicates words tied together by concordance of form as in the subject-verb relationship--He is, They are, etc.

[18] In modern English, only the verbs to have and to be use the simple Class 1-Class 2 reversal to form the interrogative. With all other verbs, the question reversal is accomplished with the aid of auxiliaries--See question variation a below.

2. Variation of the basic statement pattern.

a. Statements expressed by the basic question form preceded by certain Class 4 words (seldom, rarely, never, there, and so forth).

Class 4	Class 2 ⟷ Class 1	Rarely have I seen him
		Never was he sick

b. Statements expressed by the basic question form preceded by the function word there.

There	Class 2 ⟷ Class 1	There were some flowers on the table

c. Basic statement form in which a function word of Group I (who, which, where, and so forth) takes the place of or precedes the Class 1 word in an included sentence (clause).[19]

---

[19] Fries points out that patterns c and d standing alone as free utterances are questions

(c)	(d)
Who came	Were they all here
Which boys came	Should he come

In spoken language, intonation distinguishes between these structures used alone as questions and in included sentences to form parts of statements. Compare the following:

Who will send him	Who will send him we don't know
Should he come	Should he come we will assist him

Examples such as these are included in the Nonsense Test to see how effectively typographical indication of sentence inclusion can substitute for intonation clues.

I ↔ Class 2.... Who came I don't know

I Class 1 ↔ Class 2.... Which boys came is important

d. Statements expressed by the basic question form or by variation a below used in included sentences.

Class 2 ↔ Class 1 Were they all here we should be ready

B ↔ Class 1 Class 2 Should he come we will greet him

2. Variations of the basic question pattern.

a. Questions in which the reversal is accomplished with function words of Group B (verbal auxiliaries).

B ↔ Class 1 Class 2 Did he go

May he go

b. Questions in which function words of Group I (who, what, howmany, and so forth) take the place of or precede the Class 1 word in the basic statement pattern.

I ↔ Class 2 Who came

I Class 1 ↔ Class 2 Which boys came

c. Basic question form or variation a above preceded by a function word of Group I.

I Class 2 ↔ Class 1 Where was he

I B ↔ Class 1 Class 2 Where did he go

The Test Section

Part III of the Nonsense Test measures the subject's ability to recognize the structural patterns that signal

sentence type. The subject is presented with seventeen nonsense sentences and asked to tell whether each is a statement, question, or command. The sentence patterns suggested by Fries are used, together with a variation inserted by the investigator. Intonation patterns giving clues to sentence types have necessarily been omitted or suggested by typographical cues. The patterns used in the test sentences are as follows:

(Sentence)	(Type)	(Pattern)
1	Statement	Basic form.
2	Question	Variation a with Did.
3	Question	Variation c with When.
4	Statement	Variation a with Here.
5	Command	Basic form, transitive verb, plural object.
6	Command	Basic form, transitive verb, singular object.
7	Question	Variation c with Where.
8	Statement	Variation a with Never.
9	Question	Variation of variation c (not mentioned by Fries).
10	Command	Intransitive verb.

(Sentence)	(Type)	(Pattern)
11	Question	Basic form with <u>to be</u>.[20]
12	Question	Variation <u>a</u> with <u>will</u>.
13	Statement	Variation <u>b</u>.
14	Question	Variation <u>b</u>, with Class 1 word.
15	Question	Variation <u>b</u>, no Class 1 word.
16	Statement	Variation <u>c</u> with Class 1 word.
17	Statement	Variation <u>d</u>.
18	Statement	Variation <u>c</u>, no Class 1 word.

---

[20]The Class 2 word <u>is</u> is used in this sentence instead of a nonsense word because it is one of the two Class 2 words that use simple reversal to form the interrogative--See footnote 18. The verbs <u>to have</u> and <u>to be</u> are used in several other sentences in this test section to clarify sentence patterns. In sentence 6, in particular, it is the lack of concordance in form between <u>have</u> and <u>the rup</u> that makes the sentence a command instead of a question.

Section IV: Recognition of Part of Speech

Friesian Background

We have seen that words as parts of speech rather than words as lexical items are the units of language structure, and that it is necessary for us to recognize the part of speech of each word in a sentence if the sentence is to convey meaning. Such part-of-speech recognition need not be conscious or explicit, however. Fries describes it as "an automatic conditioned response that, in general, the naive speaker cannot usually analyze or describe" (Fries, 1952, page 111).

Fries found that form-classes or parts of speech could be recognized in utterances by their positions in structures "identified by the recognition of the other form-classes of which the structures are composed" (Fries, 1952, page 119), and also by certain formal characteristics and markers. Sometimes several cues to the form-class of a word may be supplied, but this apparently redundant information may in reality be necessary to make the structural meaning of the utterance clear to a particular listener or reader.[21] For example, in the sentence

The men derided the fructions

provided that we recognize derided as a transitive verb,

---

[21] This statement and the examples elaborating it are implied but not given by Fries. The Fries exposition and examples which served as a basis for this material are on pages 119 and 125 of The Structure of English.

position alone identifies fructions as a Class 1 word. If derided, however, were an unknown word, we should need the additional cue supplied by the Class 1 marker the or the Class 1 ending tions to establish the part of speech of fructions. With fructions identified as a Class 1 word, derided is automatically established as a transitive verb. If, on the other hand, all the words in the sentence were unknown and inadequately marked as to form-class, as in

Mag drobe fructs

position alone would not establish the part of speech of the various words and the utterance would be meaningless. The above sentence could conceivably pattern like any of the following:

Bring cold drinks

Tom drove tractors

Jack smiled sometimes

Fries found the following cues to form-class membership in the material he analyzed:

1. Class 1 words.

a. Regular patterns of contrast of form between Class 1 words and the words of the other form-classes.

(Class 1)	(Class 2)	(Class 1)	(Class 3)
arrival	arrive	bigness	big
departure	depart	activity	activity
and so forth.		and so forth.	

b. All compounds of which the last unit is one, body, thing, or self/selves.

someone somebody something myself

c. The s ending coinciding with the meaning of more than one item of whatever the word represents

boys boy desks desk

d. A few other formal identifying contrasts in the forms of particular Class 1 words which also coincide with the meanings one and more than one.[22]

men man children child

e. The 's[23] ending coinciding with the meanings of possession, ownership, and related to.

the boy's hat the boys' hats

f. All words marked by function words of Group A (determiners)--a, the, some, their, four, all, and so forth.

g. Words used with function words of Group F (prepositions).

h. Positions in structures identified by the recognition of the other form-classes of which the structures are composed. For example, words that occupy the positions of the underlined words in sentences that pattern like the following are Class 1 words:[24]

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[22]It seems to this writer that response to these contrasts in form involves recognition of the words as items, and therefore prior knowledge of their form-class.

[23]Fries throughout describes spoken rather than written language, and so omits the apostrophe here.

[24]Questions make variations of these basic patterns.

i.....The pupils ran out.

ii.....This girl is my teacher.

iii, iv...The boys lighted the lamps.

vv.....There is a guard there.

Those occupying the underlined positions in the following additional examples may be Class 1 words, but need additional identification:[25]

vi,vii....The committee gets the boy his job.

viii.....The publisher issued his bulletin last Monday.

ix, x.....This student, my assistant, brought the papers and grades.

xi.....This morning my assistant brought the papers and grades.

2. Class 2 words.

a. Regular patterns of contrast of form between Class 2 words and the words of other form-classes.

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[25]Fries does not make this statement, but his examples seem to support it. To test whether position alone is sufficient cue to form-class membership, we may replace any of the underlined words with nouns such as sugar or today that require no determiner and then see if a nonsense word would necessarily pattern like a Class 1 word.

1. The publisher issued sugar today.
2. The publisher issued sugar corbles.
3. The publisher issued blug corbles.

In sentence 2, corbles might stand for a Class 4 word such as always, and in sentence 3, blug might stand for a Class 3 word.

(Class 2)	(Class 1)	(Class 2)	(Class 3)
befriend	friend	brighten	bright
colonize	colony	enable	able
and so forth.		and so forth.	

b. The suffix ed[26] coinciding with setting in past time.

walk	walked	want	wanted

c. The s ending generally coinciding with a lack of s ending on the preceding Class 1 word.

Your husband knows...

These formulas appear...

d. Words used with the function words of Group B (verb auxiliaries)--can, did, may, has, will, should, and so forth.

e. Position in adequately identified structures. Words that occupy the positions of the underlined words in sentences patterning like the following are Class 2 words:[27]

i.....Coffee is good.

ii.....The team went there.

iii....The clerk remembered the tax.

iv.....There goes John.

v.....There is jam on your shirt.

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[26]Fries expresses this ending phonetically in keeping with his emphasis on spoken language.

[27]The first three examples are Fries' basic sentence frames for testing part-of-speech membership (Fries, 1962, pp. 78-79). The other examples are the investigator's based on Chapter VIII of The Structure of English.

vi.....Here John lives.

vii.....John quickly hid the paper.

viii....Never was John sick.

x.....Which boys went?

xi.....Have you a pencil?

xii.....Did the man pay?

xiii....May he come?

xiv.....What was advertised?

xv.....What did he make?

xvi.....Come here.

xvii....Eat the cookie.

3. Class 3 words.

a. Regular patterns of contrast of form between Class 3 words and the words of other form-classes.

(Class 3)	(Class 1)	(Class 3)	(Class 2)
baggy	bag	confident	confide
bookish	book	allowable	allow
and so forth.		and so forth.	

b. The endings er and est coinciding with the meaning of amount or degree of the quality which is the referent of the word.

bigger biggest (big)

c. Words used with function words of Group D--more, very, fairly, rather, and so forth.[28]

more friendly most friendly

[28]Roberts (1958) calls these words intensifiers.

d. Position in adequately identified structures. Words that occupy the positions of the underlined words in sentences patterning like the following may be Class 3 words.[29]

i.....The concert is/was <u>good</u>.

ii.....The <u>tall</u> boy fell.

iii....I saw a <u>big</u> star.

iv.....Friction made the skin <u>red</u>.

v.....Most of the groups will remain <u>loyal</u>.

4. <u>Class 4 words</u>.

a. Regular patterns of contrast of form between Class 4 words and words of other form-classes.

(Class 4)	(Class 3)	(Class 4)	(Class 1)
noisily	noisy	away	way
along	long	daily	day
and so forth.		seaward	sea
		and so forth.	

b. Compounds with <u>where</u>, <u>time</u>, <u>way</u>.

anywhere sometime(s) sideways

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[29]Examples i and iv are from Fries. The other examples are the investigator's based on material in Chapter X (<u>Modifiers</u>) of <u>The Structure of English</u>. In all the examples, the underlined word might be replaced with a Class 1 word, as in

The concert was a <u>success</u>.

The <u>village</u> boy fell.

Friction gave the skin <u>strength</u>.

Position in adequately identified structures. Words that occupy the positions of the underlined words in sentences patterning like the following are or may be Class 4 words:[30]

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[30]The statement is the writer's, but the examples supporting it are from Fries. The writer had some difficulty with Fries' treatment of Class 4 words. If position in the basic sentence frames (see Chapter I above) is the basis for form-class membership, it seems as logical to call words like today Class 4 as Class 1, unless priorities among positions are arbitrarily established for classification purposes. It also seems that, just as in function words lexical meaning is closely bound with structural, so in Class 4 words, structural meaning is closely bound with lexical. Fries finds it necessary to place Class 4 words into three main groups for which the words thus, there, and then may be substituted. Position in utterances coincides with this classification, words of the thus groups having different privileges of occurrence from those of the there or then groups, and so forth.

(thus) (thus) (there) (then)

He ran quickly down there afterwards.

The three groups seem to carry different structural meanings: yet few formal markers exist to distinguish among them--particularly between the there and then groups. Similarly, subcategories of Class 3 words linked with lexical meaning have different privileges of occurrence--We say "two little chairs," but not "little two chairs." It seems to this writer that many Class 3 and Class 4 words are like function words in that they must be known as items if one is to apprehend their structural significance. Certainly it is difficult or impossible to test this significance by the nonsense word technique, particularly in the case of Class 4 words.

Fries recognizes special difficulties involved in the structural analysis of Class 4 words and speaks of further investigation needing to be done (Fries, 1952, p. 227, footnote). The discussion on the following pages is also pertinent: pp. 83-86, 132-141, and sections of Chapter X (Modifiers).

i.....The concert was good always.

ii.....The clerk remembered the tax suddenly.

iii, iv.....The team went there quickly.

v, vi, vii....The men went down rapidly often.

viii.....The work thereafter was interesting.

ix.....It usually runs from sixty to eighty.

x.....They're entirely wrong.

xi.....Three of them came a day early.

xii, xiii.....They had to go away out.

The Test Section

To test exhaustively and independently the efficacy of each cue to form-class membership found by Fries is beyond the scope of this investigation, but in Part 4 of the Nonsense Test the subject is required to respond to some of the more common cues for each form-class.[31] Twenty-five sentences are presented in which nonsense words replace words of the four form-classes. In each sentence, one of the nonsense words is underlined and the subject is required to select a possible English equivalent from three choices presented after the sentence. Where cues in the sentence itself do not unequivocably identify the form-class of the underlined word, ambiguity is eliminated by restriction of response choice, only one possible alternative being

[31] Fries' "regular patterns of contrast of form" between words of the different form-classes have been used only twice in the test (sentences 11 and 15). They would form an interesting and worthwhile subject for a separate investigation.

given.[32] The English words presented as response alternatives are familiar enough to be in the everyday vocabulary of normal nine-year-olds.[33]

The nonsense words presented for form-class recognition in the test sentences and the cues provided are as follows. The position numbers refer to the illustrative sentences under the appropriate sections of Friesian Background above.

Sentence	Test word	Form-class	Cues provided
1.	urst	1	Determiner, position (ii)
2.	Combles	1	Position (iii)
3.	Rumpf	1	Position (viii), restriction of choice
4.	tonker	3	er ending, position (i)
5.	reet's	1	's ending, position
6.	abble	4	position (x), restriction of choice
7.	barp	1	Determiner, position (iv)
8.	frond	3	Position (i), restriction of choice
9.	rupes	1	s ending, determiner, position (i)
10.	tuckle	2	Auxiliary, position (iii)
11.	tonable	3	Preceding more, able ending
122	endles	2	s ending, position (xii)

[32]It would be interesting to give a test in which ambiguities were deliberately introduced to see if choice patterns revealed themselves among different groups of subjects.

[33]Educated guess.

Sentence	Test word	Form-class	Cues provided>
13.	rente	3	Position (iii)
14.	purg	3	Preceding rather, restriction of choice
15.	stullen	2	Auxiliary, position (iii), en ending
16.	teave	1	Determiner
17.	garber	1	Determiner, preposition
18.	prontly	4	ly ending, position (ix)
19.	Bittle	2	Position (xvii)
20.	Nipe	1[34]	Preposition in, position (xi)
21.	forbed	2	ed ending, position (ii)
22.	frobes	2	s ending, position (iv)
23.	rubst	1	Position (v)
24.	smore	1	Position (i)--question variation
25.	est	2[35]	Position (viii)

Part V: Meanings Carried by Subjects, Objects, Predicate Nouns and Appositives

Friesian Background

Fries insists that subjects and objects are essentially structures. He rejects the usual definitions in terms of meaning--"The subject is that about which something is asserted," "The object is the receiver of the action," and so forth--by showing their inadequacy or inapplicability in

[32]Subcategory. Lexical meaning enters here to the extent that the subject must choose the subcategory month from the subcategory of nouns for which then rather than he, she, or it may be substituted.

[35]Subcategory.

sentences such as the following:

1. What killed the cat?
2. The men built the tool house very slowly.
3. The tool house was built by the men very slowly.
4. The building of the tool house was very slow.

In these sentences, something is asserted about cat, men, and tool house, but not all of these elements are subjects. The performer and receiver of the action in sentences 2, 3, and 4 are the same though the subject changes, and sentences 3 and 4 have no object.

Subjects and objects, then, "have no relation to the actual facts of a situation in the real world. As grammatical terms they are simply names for particular formal structures within an utterance." (Fries, 1952, page 175). They convey information about the real world, but different information can be conveyed by the same structure (for example, the subject), and a single piece of information (for example, performer of the action) can be carried by different structures as in sentences 2 and 3 above.

Subjects. Fries defines the subject as "the Class 1 word or words that is tied with a Class 2 word to form the basic pattern of the sentence" (Fries, 1952, page 176). He gives five different meanings that the structure subject may carry and presents for each the particular items of form and structure that identify it. (Fries, 1952, pp. 178-183).

1. Performer.

Example: The dean approved all our recommendations.

The subject signals performer when the Class 2 word with which it is bound is not one of a special list of so-called joining verbs, or one of the forms of be and get used as function words with the past participles.

Basic sentence pattern: D 1 ⟷ 2 (4)[36]

2. That which is identified.

Example: One difficulty is the size of the trees.

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[36]The formulae given in this section are either specifically presented by Fries (1952, pp. 189-195) or implied by his descriptions of sentence patterns. Certain symbols used by Fries to supply information inapplicable to this study have been omitted. The symbols used here are as follows:

D...Determiner (Function word of Group A).
1...Any Class 1 word.
2...Any Class 2 word except those of the special list headed by forms of be.
2b..Any Class 2 word of the special list mentioned above.
3...Any Class 3 word.
4...Any Class 4 word.
1^{a}, 1^{b}, 1^{c}... The letter exponents indicate whether the he it th
referents of the two Class 1 words are the same or different: words with the same exponent have the same referent. The words and the th under the number symbols indicate the substitute groups to which the Class 1 words belong--he indicates a word for which he or she could be substituted; th one for which the Class 4 words then, thus, or there could be substituted. Fries discusses substitute groups on pp. 119-122.

2=, 2-d, 2-ng...The symbols following the symbol for a Class 2 word indicate the form of that word: 2= represents the infinitive form; 2-d the preterit or past participle; and 2-ng the ing form.

The subject signals that which is identified whenever the Class 2 word with which it is bound is one of a special list (most frequently the forms of be), and the Class 2 word is followed by a Class 1 word having the same referent as the subject.

Basic sentence pattern: D $1^a \longleftrightarrow$ 2b 1^a

3. That which is described.

Example: The abstract is very bulky.

The subject signals that which is described whenever the Class 2 word with which it is bound is one of a special list (most frequently the forms of be), and this Class 2 word is followed by a Class 3 word.

Basic sentence pattern: D $1^a \longleftrightarrow$ 2b 3

4. That which undergoes the action.

Examples: a) The requisition was sent over a week ago.

b) The orchids were given the ladies.

The subject signals that which undergoes the action when the Class 2 word to which it is bound is the function word be, in its various forms, or get, with the past participle, and no Class 1 word follows the Class 2 word as in example a above. When a Class 1 word follows the Class 2 word as in example b above, the subject signals either undergoer of action or that to or for which the action is performed (see 5 below).

Basic sentence patterns: D 1 $\longleftrightarrow$ is/get 2-d

D $1^a \longleftrightarrow$ is/get 2-d 1^b

5. That to or for which the action is performed.

Example: All the ladies were given orchids.

When the Class 2 word to which the subject is bound is the function word be in its various forms or get with the past participle, as in 4 above, and the Class 2 word is followed by a Class 1 word, the subject may signal that to or for which the action is performed.

Basic pattern: D $1^a \longleftrightarrow$ is/get 2-d 1^b

Fries shows that a clear distinction between the two possible meanings of subject in this pattern can only be made under two conditions:

a. When the Class 1 words before and after the Class 2 word belong to different substitute groups as described in footnote 36 above.

Examples:

The mother was given the boy.....Ambiguous.
(he/she) (he/she)

The money was given the mother....Subject with meaning 4.
(it) (he/she)

The mother was given the money....Subject with meaning 5.
(he/she) (it)

b. When one of the Class 1 words is preceded by a specific determiner such as the and the other by a general determiner such as a.

Examples:

The mother was given the son.....Ambiguous.

The mother was given a son.....Subject with meaning 5.

A mother was given the son.....Subject with meaning 4.

Objects. Fries does not give a general definition of object except to say that it is a structure in which a Class 1 word enters. Instead, he gives four meanings carried by objects, and associates each with the labels of traditional grammar--direct object, indirect object, objective complement, adverbial object. As in the case of subjects, it must be remembered that the meanings are not identifying features, since the same meaning may be expressed by different structures.

1. That which undergoes the action[37]--Direct object.

Example: You'll have to dig the holes for the posts.

The direct object normally follows the Class 2 word, is not tied to it by concordance of form, and does not have the same referent as the subject.

Basic sentence pattern: D $1^a \longleftrightarrow 2$ D 1^b

2. That to or for which an action is performed--Indirect object.

Example: I can furnish your man all necessary tools.

We infer from Fries that the indirect object is the first of two Class 1 words following the Class 2 word and having a referent different not only from the subject but also from the succeeding Class 1 word.

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[37]Fries points out that undergoer here, as in the case of performer for subjects, must be interpreted in a broad, linguistic sense.

Basic sentence pattern: D $1^a \leftrightarrow 2$ D 1^b 1^c

3. That which results from the action upon an undergoer--Objective complement.

Example: The first time they elected B___ V___ senator was....

When two Class 1 words follow a Class 2 word and have the same referent, the second of the two is the object complement.

Basic sentence pattern: D $1^a \leftrightarrow 2$ D 1^b D 1^b

4. Time, place, manner--Adverbial objects.

Examples: The committee approved the request last Sunday.

He started that way I know.

No, it can't be done that way.

Class 1 words for which the Class 4 words then, there, or thus can be substituted express time, place, or manner.

Basic sentence patterns: D 1^a (he/she) $\leftrightarrow$ 2 D 1^b (it) D 1^c (th)

D 1^a (he/she) $\leftrightarrow$ 2 D 1^b (th)

and so forth.

Predicate nominative, appositive, and noun adjunct.

The other Class 1 structures with which Fries deals are those generally termed predicate nominative, appositive, and noun adjunct. They all carry the meaning of characteristics of identification.

1. Predicate nominative.

Example: My husband is the <u>director</u>.

The predicate nominative serves to identify Class 1 words used with a narrow list of Class 2 words of which the forms of <u>be</u> are the most frequent. It has the same referent as the Class 1 word with which it is associated.

Basic sentence pattern: D $1^a \longleftrightarrow 2b$ D 1^a

2. Appositive.

Example: This student, my <u>assistant</u>, brought the papers.

The appositive has the same referent as the Class 1 word it identifies.[37]

Basic sentence pattern: D 1^a D $1^a \longleftrightarrow 2$ D 1^b

3. Noun adjunct.

Example: Will you be able to take my <u>Friday</u> class.

The noun adjunct never has the same referent as the Class 1 word it identifies. It appears before the Class 1 word.

Basic sentence pattern: D 1^a $1^b \longleftrightarrow 2$ D 1^c

<u>The Test Section</u>

In Part V of the Nonsense Test, a multiple-choice technique is used to probe the subject's apprehension of the meanings signalled by the foregoing Class 1 Structures. Questions and statement completion items with a choice of three responses are given on each of ten nonsense

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[37] Fries does not mention the problem of distinguishing structurally between an appositive after the direct object and the objective complement. Presumably inflectional cues or their equivalents in punctuation would have to be used.

sentences. In the test sentences, only function words and such form-class words as are necessary to make the sentence patterns unambiguous are in English. In the questions and completion sentences, on the other hand, the only nonsense words used are those from the test sentences where appropriate. Relatively little use is made of the English equivalent or paraphrase techniques used in Part IV. Wherever appropriate, however, indefinite pronouns have been used in the questions to prevent selection of the correct response by the processes of matching and elimination between the "words" in the test sentences and the words in the questions. For example, after the sentence The frag burdled in the perfance, the question Who did something? or Where did someone do something? would be asked instead of Who burdled in the perfance? or Where did the frag burdle? Wherever the form-class of a word in the test sentence would otherwise be ambiguous, it is established in a preceding clause or sentence, as in item 10 of the test section. The structures and meanings tested by the test sentences are as follows:

Sentence	Pattern	Class 1 structure	Meaning
1.	1 ↔ 2-ed D 1	Subject Direct object	1
2.	D 1 ↔ is D 1	Subject Predicate noun	2
3.	D 1 ↔ 2-ed D 1 D 1	Subject Indirect object	1

Sentence	Pattern	Class 1 structure	Meaning
4.	D 1↔<u>is</u> 3	Subject	3
5.	D 1↔<u>was</u> 2-ed D 1	Subject Direct object	5[38]
6.	D 1↔2-ed 1 D 1	Subject Direct object Object complement	1
7.	D 1, D 1,↔2-ed F D 1	Subject Appositive	1
8.	1↔<u>were</u>- 2-ed <u>by</u> D 1	Subject	4
9.	1↔2-ed D 1^a 1^b F D 1	Subject Noun adjunct Direct object	1
10.	D 1↔2-ed D 1 2=[39]	Subject Direct object Variation of object complement[40]	1

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[38]Distinguished from meaning 4 by restriction of response choice.

[39]In this sentence group, the first two sentences merely establish the part of speech of <u>trig</u> and <u>lan</u>. The test sentence is the third.

[40]In this sentence, a Class 2 word in root form takes the place of the usual Class 1 word in a structure closely related to the object complement. This structure is not mentioned by Fries.

Part VI: Interpreting Sentences Containing Modifiers

Friesian Background

Fries introduces his treatment of modifiers by demonstrating the inadequacy of a definition in terms of meaning rather than form. If we say that a modifier is a word that "adds to the meaning of another word," we have difficulty explaining why burns as well as burning is not a modifier in the following:

A fire burns in the fireplace.

A burning fire is in the fireplace.

He also rejects definitions such as "An adjective is a word used to modify (describe, limit, qualify) the meaning of a noun or pronoun" on the ground that they define the unit in terms of the structure rather than describe the structure in terms of its units. Such a definition says, in effect, that whenever we have a structure of modification with a substantive as one member, the other member of the structure is an adjective by definition. Fries illustrates the difficulties raised by thus defining units of structure in terms of the structure itself. In the following sentences, for example, by no means all authorities would call the italicized words adjectives:

My father's house was a large stone building.

The appropriations committee approved our department budget.

Most of these students arrived only a few days ago.

Some of the officers there are my friends.

Because of the confusions caused by definitions such as the two given above, Fries avoids the use of the terms adjective and adverb and speaks instead of "structures of modification." He classifies them according to the type of word that acts as head or nucleus. He calls modification "a structure of connection," modifiers being forms connected in a particular way with their head words. The most basic distinguishing characteristic of a structure of modification is that it may be substituted as a unit wherever the head word could stand alone.

Fries' main classes of modifiers are (a) modifiers with a Class 1 word as head, (b) modifiers with a Class 2 word as head, (c) modifiers with a Class 3 word as head, (d) modifiers with a Class 4 word as head, and (3) modifiers with certain function words as heads. For each main class, he distinguishes subclasses where such exist, and for each class and subclass describes identifying structural features and the meaning or meanings conveyed.

Modifiers with Class 1 words as head.

1. Subclasses of modifiers with Class 1 words as head.

a. Class 1 words with Class 2 words as modifiers.

the recommending committee

a sprained wrist

b. Class 1 words with Class 3 words as modifiers.

an excellent address

his messy room

c. Class 1 words with other Class 1 words as modifiers.

my father's house

a student advisor

a paper knife

Wednesday evening

d. Class 1 words with Class 4 words as modifiers.

the work thereafter

the food there

the walk home

e. Class 1 words with modifiers consisting of a word-group introduced by one of the function words of Group F (prepositions).

(Class I)	(Modifier)
the carnival	over on the fair grounds
something	from his late trip to the Coast

f. Class 1 words with modifiers consisting of an included sentence introduced by one of the function words of Group I (who, which, that, and so forth).

(Class I)	(Modifier)
the very ones	that should be invited
the men	who came early

2. Structural features. Fries finds that the following structural features distinguish modifiers of Class 1 words from other structures involving Class 1 words:

a. The variety of form-classes and word-groups that can serve as modifiers.

b. Position between the determiner and the Class 1 word. He found that in his recorded materials, 80% of all modifiers of Class 1 words occupied this position, including all Class 3 and Class 1 modifiers, and some of Class 2.

c. Position immediately following the Class 1 word. He found that some Class 2 modifiers, most Class 4 modifiers, and all word-group modifiers of Class 1 words occupied this position.

d. In the case of Class 2 modifiers, the form of the Class 2 word used (always the ed or ng form), and the fact that the structure composed of the Class 1 word with its Class 2 modifier cannot stand alone as a situation utterance, and that it does not by its form signal statement, question, or request. One may compare modification structures involving a Class 1 and a Class 2 word with basic sentence patterns involving a subject-predicate relation.

A burning fire is in the fireplace.

A fire burns in the fireplace.

The committee recommending his promotion agreed.

The committee is recommending his promotion.

e. Certain intonation patterns tying the modifier to its Class 1 head, and in some cases carrying cues as to

meaning.[41]

3. Meanings.

a. Class 1 words with Class 2 words as modifiers. When the modifying Class 2 word has the ng form, the Class 1 word represents the performer of the action indicated in the modifier.[42] When the modifying Class 2 word has the ed form, the Class 1 word represents the undergoer of the action indicated by the modifier.

the purifying water (performer)

the purified water (undergoer)

b. Class 1 words with Class 3 words as modifiers. Except in certain special situations, delineated by Fries but not included in the Nonsense Test, Class 3 words modifying Class 1 words carry the meaning of quality to substance as represented by the Class 1 word.

those unsightly wires

pure water

c. Class 1 words with other Class 1 words as modifiers. Except in two special situations, delineated by Fries but not included in the Nonsense Test, Class 1 words modifying other Class 1 words carry the general meaning of identification, a broad term subsuming a diversity of

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[41]Those intonation patterns having graphic correlates and hence subject to exploration in a paper-and-pencil test are treated under Meanings below.

[42]Except in certain instances when intonation patterns indicate a different meaning. Compare the following:

the drinking water the drinking cattle

connections in the real world between the referents of the Class 1 and Class 3 words.

my father's house	a pillow slip
a state university	a store clerk
his bath robe	the license bureau

d. Class 1 words with Class 4 words as modifiers. Identification is the only meaning Fries finds in modification structures of this type.

the work thereafter

his study abroad

e. Class 1 words with modifiers consisting of a word-group introduced by one of the function words of Group F. Fries finds that the meaning usually carried is identification.

f. Class 1 words with included sentences as modifiers. Fries finds that this structure signals either identification or description depending on intonation patterns.[43]

(Those three men who are always grumbling (identification)

those three men, who are always grumbling (description)

Modifiers with Class 2 words as head.

1. Structures of modification with Class 2 words as head.

a. Class 2 words with Class 4 words as modifiers.

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[43]Represented in written form by presence or absence of a comma after the Class 1 word.

It usually runs from sixty to eighty.

The whole business went along nicely.

He didn't say definitely.

b. Class 2 words with Class 1 words as modifiers.

I've thought of you a thousand times today.

It worked a little while.

c. Class 2 words with Class 2 words as modifiers.

Both the boys came running when C yelled.

d. Class 2 words with Class 3 words as modifiers.

We...lay open the whole muscle.

Most of the groups will remain loyal.

e. Class 2 words with modifiers consisting of a word group introduced by a function word of Group F (prepositions).

The luncheon will begin at twelve-thirty.

They worked only for the inside people.

f. Class 2 words with included sentences as modifiers.

Can you come after your meeting is over?

2. Structural features. With respect to position, Fries states only that in general the modifiers of a Class 2 word appear in a position following the Class 2 word and in general following any Class 1 words serving as objects. He also notes that Class 4 words which modify Class 2 words can appear in certain other positions and can be grouped into three subcategories on the basis of the positions they

can occupy, words patterning like usually, along, and religiously in the sentence We carry it along religiously usually having different privileges of occurrence. For example, we may say, "We usually carry it along religious-> ly," but not "We along carry it religiously usually."

Fries also notes certain items of word "shape" or form that distinguish Class 4 modifiers of the three groups. The majority pattern like religiously and have the same formal contrast with Class 3 words--religiously, religious. Those that pattern like along are of four groups:

a. Those with the same shape as function words of Group F (in, out, down, above, and so forth).

b. Those with the prefix a (along, away, across, and so forth).

c. Those with the suffix ward (homeward, forward, and so forth).

d. Compounds ending with where (everywhere, somewhere, and so forth).

3. Meanings. Fries notes that the words then, thus, or there can be substituted for most Class 4 words modifying Class 2 words and concludes that the most common meanings carried by modifiers of Class 2 words are time, manner, and place, the distinction between these meanings being a matter of lexicon rather than structure.

Modifiers with Class 3 words as head.

1. Structures of modification with Class 3 words as head.

a. Class 3 words with function words of Group D as modifiers.

I'm awfully glad you have a place for me.

It isn't very good but it's....

The other house is pretty good....

b. Class 3 words with Class 1 words as modifiers.

It was only house high as it crossed the road.

The hole must be a foot larger each way.

It can't really be that small.

c. Class 3 words with Class 4 words as modifiers.

They're entirely wrong about....

d. Class 3 words with other Class 3 words as modifiers.

All the windows had been tight shut all night.

They made the walls a soft blue color.

e. Class 3 words with Class 2 words as modifiers.

In the morning..the cottage was freezing cold.

f. Class 3 words with word-groups as modifiers.

...ready for planting

...bigger than he can manage.

2. Structural features. All modifiers of Class 3 words, except enough and the word groups, immediately precede the Class 3 word. All are tied to the Class 3 word by intonation pattern.

3. Meaning. The meaning carried by all modifiers of Class 3 words is degree.

Modifiers with Class 4 words as head.

The same types of words and word groups that can modify Class 3 words can modify Class 4 words, the same structural patterns of position and intonation occur, and the meaning carried is also that of degree.

We're awfully short of help right now.

We really shouldn't go that far yet.

They had to go away out to the lake to get it.

P__ swam faster...than he did in the first.

Modifiers with certain function words as head.

Function words of Groups F and I can act as heads in structures of

Group F — Bob is very much like his brother.

We used to plow almost to the fence.

His footprints were....directly beneath the window.

Group I — And then immediately after the play was over, we....

A___ came in right when I was....

The same words act as modifiers here as in the case of Class 3 and Class 4 words, and the meaning conveyed is also degree. The same positions and intonation patterns occur.

The Test Section

In Part VI of the Nonsense Test, the subject is required to recognize and interpret relations in sentences containing modification structures of various types. Since

the purpose of the study was to measure skill in discerning overall sentence meaning, in so far as it is mediated by structure, ability to perceive basic sentence patterns in the presence of modifiers is tested as well as the ability to interpret the modification structures themselves. Wherever items of structure or the lexical components of function words seemed to mediate meanings not mentioned by Fries, these, too, are tested.[44]

The test section consists of 18 nonsense sentences, each followed by questions to which the subject is to write "short answers." English words are used in the test sentences wherever necessary to establish form-class membership, chiefly in the case of Class 4 words. The short-answer response was chosen over a multiple-choice technique, with or without English equivalents, because it seemed more resistant to mechanical matching, and response by elimination of alternatives. As in previous sections, indefinite pronouns are used to still further reduce the possibility of word matching between test sentences and questions.

The modification structures in the various test sentences and the meanings they carry are as follows. Structures marked with an asterisk are present in the sentence, but the subject's interpretation of them is not directly

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[44] In a number of instances, the meaning of identification seems to be present in addition to the meaning mentioned by Fries; and in cases where Fries gives identification as the meaning carried by the structure, other meanings seem to be mediated by the lexical components of the function words and Class 4 words involved. See meanings carried by modification structures in sentences 1, 2, 3, 4, 5, 6, 8, 9, 10, 11, and 12 of test.

tested. When more than one meaning is given, the first is one ascribed by Fries to similar structures, and the second is an additional meaning used by the investigator in the formulation of the test questions. A number of the modification structures mentioned by Fries do not seem easily tested by the nonsense-sentence technique, and have not, therefore, been included in the test.

Sentence	Structure of modification	Meaning
1.	Class 1 modified by Class 3	Quality to substance and identification
	Class 2 modified by Class 4 (position after Class 2)	Manner
2.	Class 1 modified by Class 4	Identification and place
	Class 2 modified by word-group*	Place
3.	Class 1 modified by Class 2 (position before Class 1)	Performer and identification
	Class 2 modified by word-group	Place
4.	Class 1 modified by Class 2 (position after Class 1)	Performer and identification
	Class 2 modified by word-group (modifier of modifier)	Place
5.	Class 1 modified by Class 2, (position before Class 1)	Undergoer and identification
	Class 2 modified by Class 4*	Manner
	Class 2 modified by Class 4	Place

Sentence	Structure of modification	Meaning
6.	Class 1 modified by Class 2 (position after Class 1)	Undergoer and identification
	Class 2 modified by word-group (modifier of modifier)	by whom
	Class 2 modified by Class 4	Time
7.	Class 1 modified by included sentence	Identification and with whom action in modifier occurred
	Class 2 modified by Class 4 (final position)	Manner
8.	Class 1 modified by word-group	Identification and place
	Class 2 modified by word-group*	Place
	Class 1 modified by Class 3	Quality to substance
9.	Class 1 modified by included sentence	Identification and undergoer of action in modifier
10.	Class 1 modified by included sentence	Identification and performer of action in modifier
	Class 2 modifier by Class 4 (modifier of modifier)	Time
11.	Class 1 modified by included sentence	Identification and time of action in modifier
	Class 1 modified by Class 3	Quality to substance

Sentence	Structure of modification	Meaning
12.	Class 1 modified by included sentence	Identification and place of action in modifier
	Class 1 modified by Class 3	Quality to substance
	Class 3 modified by Group D	Degree
13.	Class 1 modified by Class 2 (position before Class 1)	Undergoer
	Class 2 modified by Class 4*	Manner
	Class 4 modified by Group D	Degree
14.	Class 2 modified by Class 4 (position before Class 2)	Manner
	Class 2 modified by word-group	Time
15.	Class 2 modified by included sentence	Time
16.	Class 3 modified by Group D	Degree
	Group D modified by Class 2[45]	Degree
17.	Class 2 modified by Class 4	Manner
	Class 4 modified by Group D	Degree
	Group D modified by included sentence[45]	Degree
18.	Class 3 modified by included sentence	Degree

[45]This structure not mentioned by Fries.

APPENDIX C

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